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DEPARTMENT OF URBAN & REGIONAL PLANNING

UNIVERSITY OF TORONTO

230 COLLEGE STREET TORONTO, M5S 1A1, ONT.

# **An Environmental Study**

**to select  
Hydro Transmission Corridors  
for The Solandt Commission**

1973





DEPARTMENT OF URBAN & REGIONAL PLANNING

UNIVERSITY OF TORONTO

280 COLLEGE STREET TORONTO, M5S 1A1, ONT.

**An Environmental Study**  
**to select**  
**Hydro Transmission Corridors**  
**for The Solandt Commission**





## Environmental Planning Consultants

217 King Street East, Toronto M5A 1J9, Ontario (416) 361-1682

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September 13, 1973

Dr. Omond Solandt, Chairman,  
The Solandt Commission,  
Ferguson Block, Queens Park,  
Toronto.

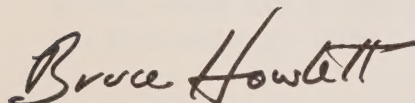
Dear Dr. Solandt:

In accordance with the terms of reference, we have completed a study designed to provide advice to the Solandt Commission on the best available route for the 500 kV line from Middleport to Pickering.

We have given emphasis to the crossing of the Niagara Escarpment and other key areas and have tried to reach a balance between the environmental, social and economic factors associated with the route. We have also endeavoured to select a route along which the line could be built quickly, with a minimum of environmental damage and local opposition. The advisability of having all lines in one corridor or separated into two or more corridors has been considered and a determination made of whether they should be included in a larger joint use corridor.

We wish to thank you for the co-operation and assistance provided by the Commission and its staff during the course of the study.

Yours truly,



Bruce Howlett  
For B.H.I. Limited

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# Project Team

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# Acknowledgements

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It is to the citizens of this dynamic and prospering region that the credit must be given for the accomplishments of this study. Without their interest and concern over the values they cherish -- the values they wish to preserve in the face of a growing technological society -- there would have been no study, no public involvement in decisions vital to the future of this part of Canada. To those who came to meetings, filled out questionnaires, served on committees, asked questions, marked out maps, wrote letters, criticized, encouraged and took part in helping to find acceptable solutions to a difficult problem we offer our sincere thanks.

To Ontario Hydro, often criticized, but trying valiantly to quickly adjust to almost revolutionary changes in public awareness and concern, goes credit for providing the vital technical assistance which provided a sound foundation for the study. Their dedicated staff provided data, attended meetings and answered difficult and pointed questions, attended innumerable committee meetings and responded to our requests for assistance.

The many agencies of the Provincial Government and the seventy-one municipalities contained within the study area provided data, maps, advice and aid which was invaluable in assuring a complete understanding of the concerns, plans and programs so vital to the study. Without their help the study would not have been possible.

To the Solandt Commission, and particularly to Dr.

Omond Solandt, who encouraged, aided, and in every way made our task easier we give special thanks.

Unfortunately, the following list can only be partial; a comprehensive list of those who participated would take many pages. The Solandt Commission has received a complete list of the groups and associations and the hundreds of individuals who participated; we apologize for not noting their names individually but, nevertheless, give our sincere appreciation for their efforts.

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# Acknowledgements

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# Acknowledgements

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MINISTRY OF AGRICULTURE AND FOOD  
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Division of Mines, Geological Branch  
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Central Lake Ontario Conservation Authority  
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Nottawasaga Valley Conservation Authority  
South Lake Simcoe Conservation Authority

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East Garafraxa Township  
Mono Township

Durham County  
Darlington Township

Halton County  
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Town of Burlington  
Town of Georgetown  
Town of Milton  
Town of Oakville  
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Metropolitan Toronto  
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Borough of Etobicoke  
Borough of North York  
Borough of Scarborough  
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Reach Township  
Scott Township  
Uxbridge Township

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Town of Streetsville  
Village of Caledon East  
Albion Township  
Caledon Township  
Chinguacousy Township  
Toronto Gore Township



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Town of Aurora  
Town of Markham  
Town of Newmarket  
Town of Richmond Hill  
Town of Vaughan  
Town of Whitchurch-Stouffville  
East Gwillimbury Township  
King Township

Glanford Township

Simcoe County  
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West Gwillimbury Township  
Tecumseh Township

Wellington County  
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Erin Township  
Eramosa Township  
Guelph Township  
Puslinch Township

Wentworth County  
City of Hamilton  
Town of Dundas  
Village of Waterdown  
Ancaster Township  
Beverly Township  
East Flamborough Township  
West Flamborough Township

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This report is divided into two parts, designated A and B.

Part A describes the process of selecting the route for the Middleport to Pickering corridor, including the environmental studies, public participation and governmental co-ordination which underly the process ; the data analysis, selection and evaluation of alternative routes; and the conclusions and recommendation for a preferred route, together with a description of its location and the procedures necessary for its installation.

Part B provides supporting information about the study, including data sources, details about the public participation program, a description of governmental agencies and planning, and comments on several topics ranging from electrical system planning to environmental impact.



**Part**  
**a**



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# Introduction

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Electric power is one of the foundations of Twentieth Century life. Without it, society would be the poorer. While some people are coming to doubt that the historic trend of power demands doubling every decade can be sustained, there is no immediate end in sight and Hydro, proceeding as it must, has prepared plans to meet those demands.

A part of these plans includes the transmission of electric power from large generating stations scattered throughout the Province to load centres, mostly in Southern Ontario. A 500,000 volt network is proposed to carry the power, often requiring two, three or more of these lines in one right-of-way. Several of these lines -- corridors in fact, because of the number of lines which must be accommodated -- pass through or interconnect in the area extending from Hamilton to Oshawa.

Where these corridors should be placed is a matter of controversy and there has been much debate and study as to the best locations. The Solandt Commission was established to look into the matter from an independent viewpoint and this report presents one aspect of the Commission's work to aid in resolving the issue.

The need for the lines has been established. The Commission found that Hydro had adequately documented the case for expected load growth and the need to increase transmission capacity. But the environmental, visual and social impacts that might be caused by the lines remain as questions of great concern. This study is directed

to identifying these problems and selecting a minimum impact location for the lines. Work has been conducted in an open planning context, with wide public participation at each stage of the study. It remains now for the Commission and the public to review the results of this program and make the final determination upon which action can proceed.

## Terms of reference

The terms of reference for this study are defined in a letter from the Solandt Commission to the Honorable A.B.R. Lawrence, Q. C. which was incorporated in the Commission's interim report of October 31, 1972:

"The terms of reference for such a study should include the following:  
The object of the study is to provide advice to the Commission on the best available route for a 500 kV line from Middleport to Pickering. In making the route selection the primary emphasis must be given to environmental factors in key areas such as the crossing of the Niagara Escarpment. In other areas the balance will be different but in all cases the environmental, social and economic factors must be considered. The aim is not to choose what is theoretically the best route but to choose a good route along which the line can be built quickly with the minimum of environmental damage and of local opposition. The



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# Introduction

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study should also consider whether it is advisable to have five lines abreast and, if so, whether they should be included in a larger joint use utility corridor or whether it would be wiser to distribute the lines between two or more corridors.

I would propose that Mr. Howlett and members of the Hydro staff working with him should begin to involve the public as early as possible. Long before any recommended routes are available for discussion it should be possible to involve the public in deciding on the factors that need to be considered in choosing the line and the weight to be attached to them. My Commission might be used as a medium for arranging suitable meetings."

## Procedure

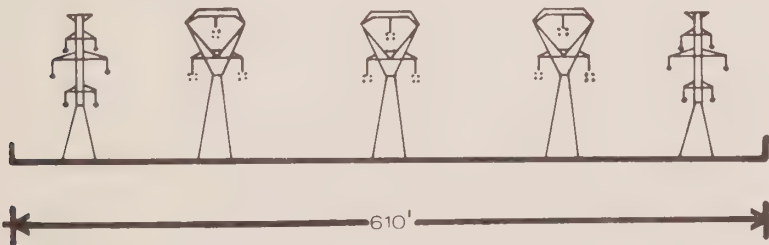
In following these guidelines we have, in the course of our study:

1. Defined a study area within which the transmission corridor could be located;
2. Within the study area, inventoried a wide variety of environmental features which could be affected by the corridor;
3. Mapped and analyzed the inventoried data in terms of the relative impact of a transmission line corridor, using public opinion as a guide;
4. Selected alternative locations for the corridor, any of which would satisfy Hydro's alternate system requirements, taking into account the crossing of the Niagara Escarpment and other significant environmental areas;
5. Considered the general economic costs of the alternatives and of improved appearance towers and substations;
6. Selected a preferred corridor based on an environmental evaluation of each alternate location, on the opinions of the public, and on the suggestions and recommendations of Provincial agencies and local governments;
7. Suggested means for ameliorating environmental impacts remaining on the preferred corridor, indicated desirable designs for transmission towers and electrical substations, and proposed auxiliary uses compatible with the right-of-way;
8. Undertaken all elements of the study with as wide public participation as practicable.

# The Task

In order to meet Ontario's ever growing needs for electric energy, Ontario Hydro has undertaken a program to construct new generating stations and transmission lines throughout the Province. The 500 kV (500,000 volt) transmission corridor from Middleport to Pickering is a key part of Hydro's proposed transmission grid which will interconnect power generating plants throughout the Province with major load centres, mostly in Southern Ontario. The Middleport-Pickering line is only one segment of a much longer line which begins west of the study area, passes through it and continues east out of the area. Transmission at 500 kV represents a new phase in meeting the increasing electric power demands which require that Hydro construct more and larger generating stations as well as higher voltage transmission lines to connect them with consumers of electricity.

From Middleport to Pickering, Hydro stated at the outset that a 610 foot wide corridor was required to accommodate five lines at maximum, consisting of three single circuit 500 kV lines and two double circuit 230 kV lines.\*



3-SINGLE CIRCUIT 500 KV TOWERS & 2-DOUBLE CIRCUIT 500 KV TOWERS

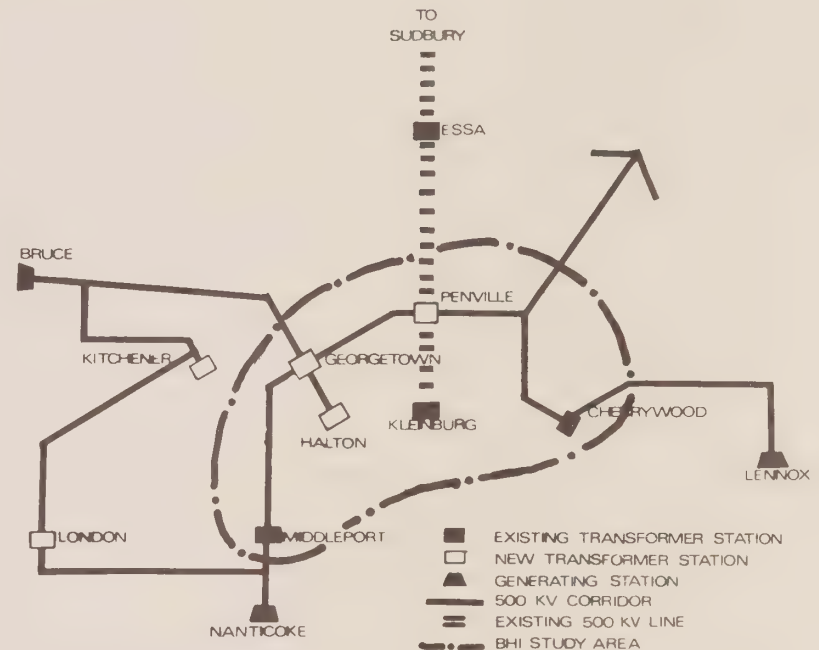


Diagram based on Ontario Hydro's «middle route»

In addition to selecting an east-west corridor for the Middleport-Pickering line, the terms of reference of our study were broadened to include north-south corridors which would connect transformer stations on the east-west corridor to generating stations outside the study area.

\* a single circuit consists of three wires on one tower, a double circuit of six wires on one tower.

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# The Task

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The most westerly of these connects to the Bruce station on Lake Huron and requires a 600 foot corridor to accommodate three double circuit 500 kV lines. The connection from Kleinburg north to Sudbury already has two single circuit 500 kV lines on it, with an additional requirement of two double circuit 500 kV lines and one additional 230 kV line all to be located within a 900 foot corridor that Hydro already owns. From the general vicinity of Newmarket, a third corridor is proposed to extend northward on the east side of Lake Simcoe. This corridor will consist of two double circuit 500 kV towers and one double circuit 230 kV line, requiring a right-of-way 500 feet wide.

Substations will also be required to transform the power from 500 kV to 230 kV and interconnect with existing lines. Between four and six of these will be needed, depending on the route selected.

The primary task of this study is to locate alignments for these corridors and general sites for the substations which have a minimum environmental impact, are responsive to public concerns and which satisfy Hydro's system requirements.



# The Task

## Systems alternatives

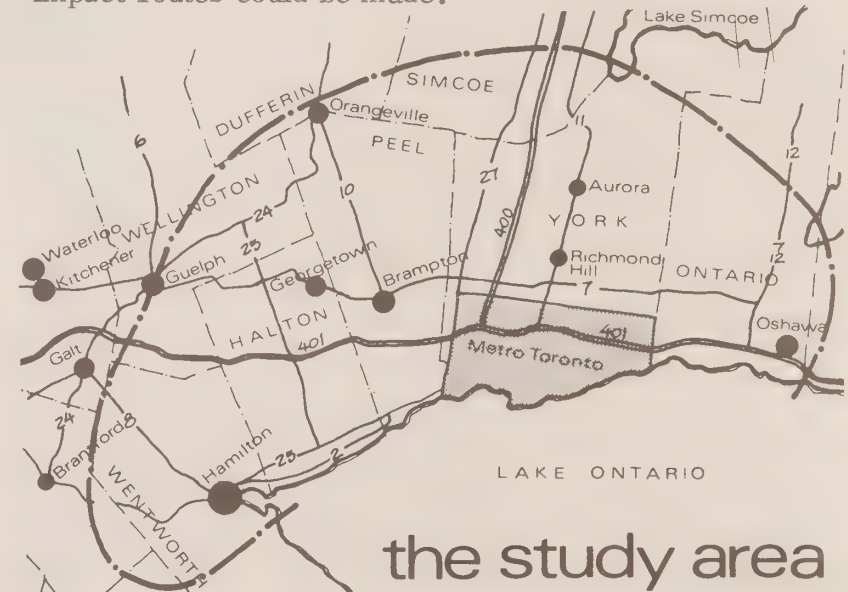
In a simplistic way, what is outlined above represents the basic requirements of Hydro's transmission system within the study area. After the study commenced, discussion with Hydro's system planning staff indicated that there was some latitude in the actual number of lines that would be required in any particular corridor, depending on where it was located, how it interconnected with the corridors from the north and how it linked to the existing 230 kV transmission grid. Because some configurations would perhaps require fewer lines or substations, at our request, Hydro prepared a diagram indicating four alternative electrical systems that would satisfy their needs, noting that other combinations were also possible. While these are diagrammatic, they provided the basis for studying possible locations for alternative study corridors.

Hydro also indicated that not all lines would be required immediately. While some are required in the next few years, others would not be needed until the 1980's. Again, the timing of need depended in part on the system selected.

## The study area

In their submission to the Solandt Commission on July 31, 1972, Hydro presented maps indicating several possible alignments for the Middleport-Pickering corridor. In discussion with Hydro staff, it was found that any alignment within the area encompassed by all the alter-

natives would be feasible from an electrical standpoint. In a preliminary study of features in the region it was determined that a study area which included those lines previously studied would encompass all reasonable alternatives from electrical, environmental and economic standpoints. On this basis a circumferential line was selected extending from Middleport, located to the southwest of Hamilton, northerly through Guelph, then beyond Orangeville, north of Bradford, through the south end of Lake Simcoe, thence to Port Perry on Lake Scugog, then south to Lake Ontario in the vicinity east of Oshawa. Within this 3,340 square mile area, an environmental inventory would be taken from which a selection of minimum impact routes could be made.



# The Task

## Mapping scale

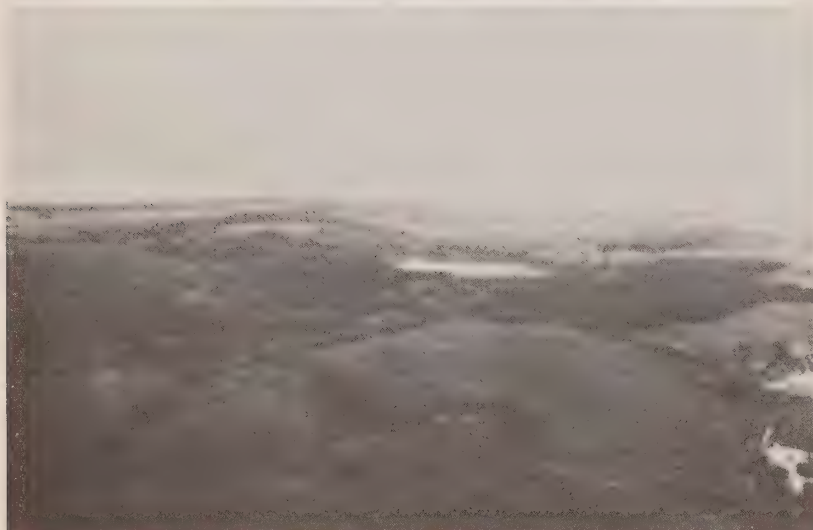
Because the study was to be undertaken with as much public participation as possible, it was necessary that people clearly understood the environmental data that was inventoried. Maps at a scale of 1:50,000 (1 inch equals 4,166 feet) were available for the entire study area from the Army Service Establishment, R.C.E.; these maps are of sufficient scale to show individual houses but are not too large to be compiled into one map covering the entire study area for public display purposes. The decision was made to use these maps so that the public could understand the full regional context of the study yet still be able to relate to known points, places and homesites. In spite of the fact that these maps are of varying age, with some dating from 1935, they form a good base map on which to display current information.



Figure 3: Sample of Army Survey Topographical Maps at 1:50,000 scale which formed the base for the inventory maps.

# The Environment

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# The Environment

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## The inventory maps

A transmission line can have a wide variety of impacts both on nature and man. Depending on its location and the manner in which the right-of-way is managed, a transmission line can affect vegetation, streams, erosive soils, wildlife habitat and a number of other natural features. Similarly a line can affect man-made resources by restricting agricultural activities, affecting development patterns, impairing the character of residential areas and recreational sites, and by making a visual impact.

In order to avoid or reduce these impacts to a minimum, it is necessary to know where these impacts might occur well before a route for the line is selected. The first step then, in selecting a minimum impact alignment for the Middleport-Pickering corridor and the connecting corridors, is to inventory those environmental features that could be affected.

Eight maps comprise the inventory, each dealing with a specific environmental topic. Sources for the data were many and varied, ranging from Provincial and local government sources to information provided by local citizens. A more detailed description of categories and sources is included in Part B of this report.

The first map portrays the current distribution of man-made land uses throughout the study area. Map 1 was photographically reduced from the full scale 5 foot by

10 foot map on which the data was originally prepared. Outside of built-up areas, every home, farm centre and cottage has been inventoried, along with industrial sites, shopping areas, institutions, airports, radio towers and three types of agricultural land. Because there was no up-to-date land use information available, the data shown on Map 1 was inventoried from original sources. Using maps prepared by the Toronto-Centred region planning staff as a general guide, a team from Ontario Hydro were directed by B.H.I. in preparing the basic data for Map 1 by means of aerial photo land use interpretation. Hydro had secured aerial photo coverage of the area in October and November of 1972, so the data shown is current.





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# The Environment

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Because of their particular significance, existing cultural, recreational and open space uses were separately inventoried on Map 2. Parks, conservation authority lands, golf courses, and other recreation sites are indicated, along with trails and cemeteries. An attempt to map historic sites was unsuccessful because of the lack of detailed information in existing inventories of this region.

In siting a transmission line, the possibility of following existing rights-of-way was considered, not only along Hydro lines but along other transportation uses as well. Map 3 shows these "linear land uses" including highways and expressways, gas and oil pipelines, railroads, and Hydro rights-of-way. Wherever room for expansion is available within existing Hydro corridors, this is separately shown. For this report, Maps 2 and 3 have been shown as one.

An inventory of land use would not be complete without the uses which are proposed for the future. Not only should a transmission corridor have a minimum impact on existing land uses, but it should conflict as little as possible with uses that are yet to come. Future, or proposed land uses are shown on Map 4 and include all municipal Official Plans, provincial agency plans and regional agency plans. Municipal Official Plans are in various stages of preparation and approval, and to indicate as complete a picture as possible, plans which are approved, in draft form, or proposed, are all included. Regional plans are also shown on Map 4. All publicly available



data on plans for the Parkway Belt, the Niagara Escarpment, the Pickering Airport and the new town of Cedarwood are portrayed together with provincially proposed landfill sites and potential regional parks proposed by the Central Ontario Joint Planning Board.

Characteristics of the natural environment are inventoried on three maps. The first of these, Map 5, Natural Resources, includes woodlands, county and agreement forests, and agricultural land capability by class.

The second of this group, Map 6, shows the more critical

# The Environment

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natural features of the study area, including flood plains, steep slopes, lakes, rivers and streams, wetlands, and sensitive natural sites as designated by several agencies under the auspices of the Toronto-Centred Region Plan.

Natural features of the region which contribute to its scenic quality are inventoried on Map 7. Our analysis of these features utilizes information derived mainly from other maps (topographic, physiographic, recreational capability). Map 7 shows the striking physical character of many parts of the study area, including valleys, wetlands, lakes, streams, the dominant physical aspects of the Escarpment, and other diverse landforms. For this report, Maps 6 and 7 have been combined. In order to assess the physical diversity of the landform throughout the region, Map 8, Land Elevation, was prepared. This indicates the relative heights of land in 100 foot contours from mean sea level.

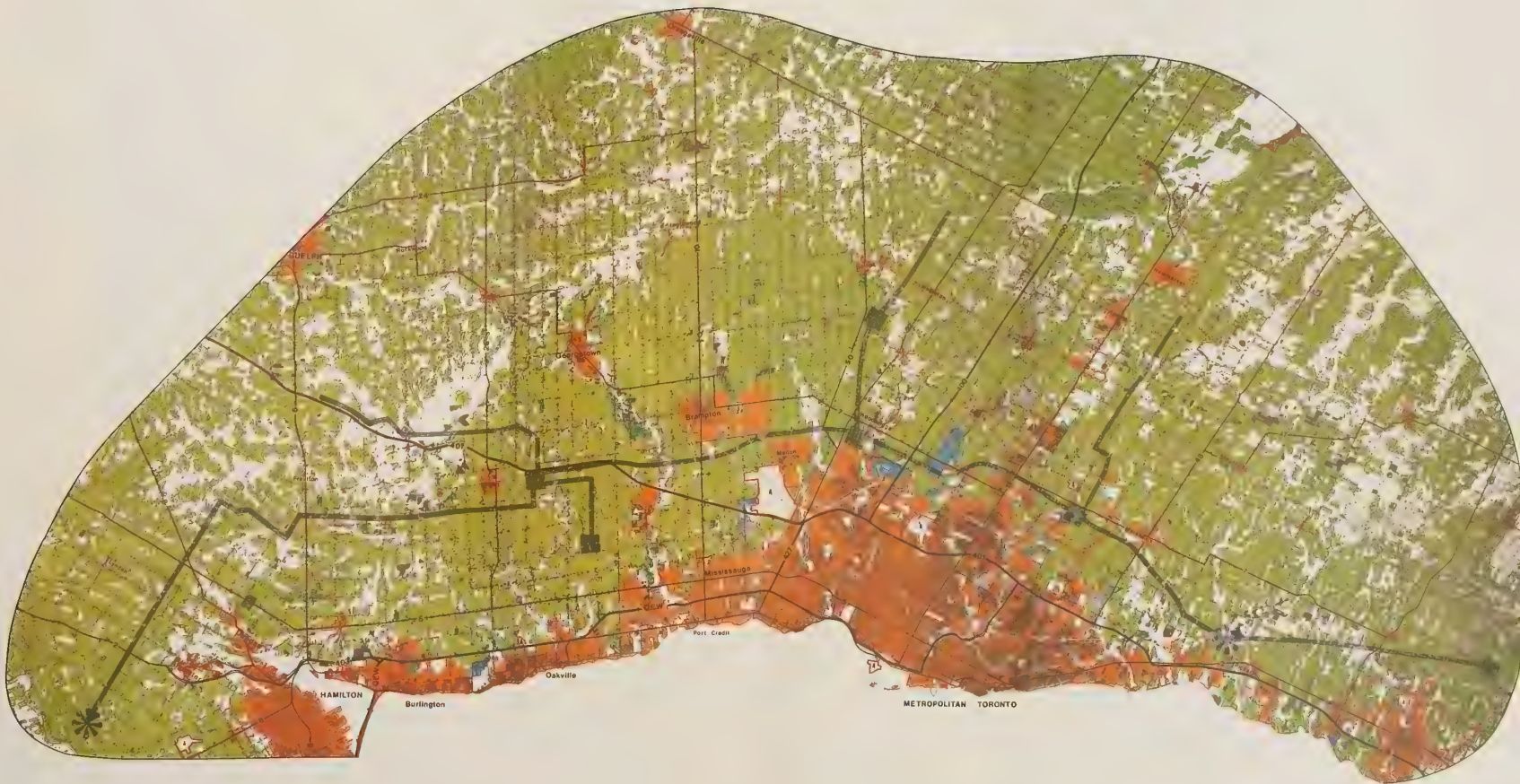
The last map of the inventory series summarizes the responses received from the public on sites they feel are environmentally significant. During the early part of the study, blank maps and data books were widely distributed throughout the region. Many people took the opportunity to show and describe sites they considered to be important so that the information could be taken into account in the siting studies. Map 9 portrays a variety of information, including trails, historic sites, viewpoints, habitat areas and other data. Generally, it was found that people in the area where Ontario Hydro had proposed its original

route were more responsive in providing data. Because responses were not received equally from all parts of the region, this map was only used as a check on corridors derived from other inventory maps.

Other mapped data that formed part of the inventory but not reproduced in this report, included very general information provided by Hydro on regional land values; and also information on erodable soils, mineral resources, historic and archeologic sites.







# An Environmental Study

to select **Hydro Transmission Corridors**  
for **The Solandt Commission**

**bhi** Environmental Planning Consultants  
LIMITED Toronto, Ontario Canada August 1973

50000



## 1 PRESENT LAND USE

- urban built-up
- general residential
- active farm centre
- rural, non-farm residential
- seasonal residential
- under construction
- commercial
- industrial

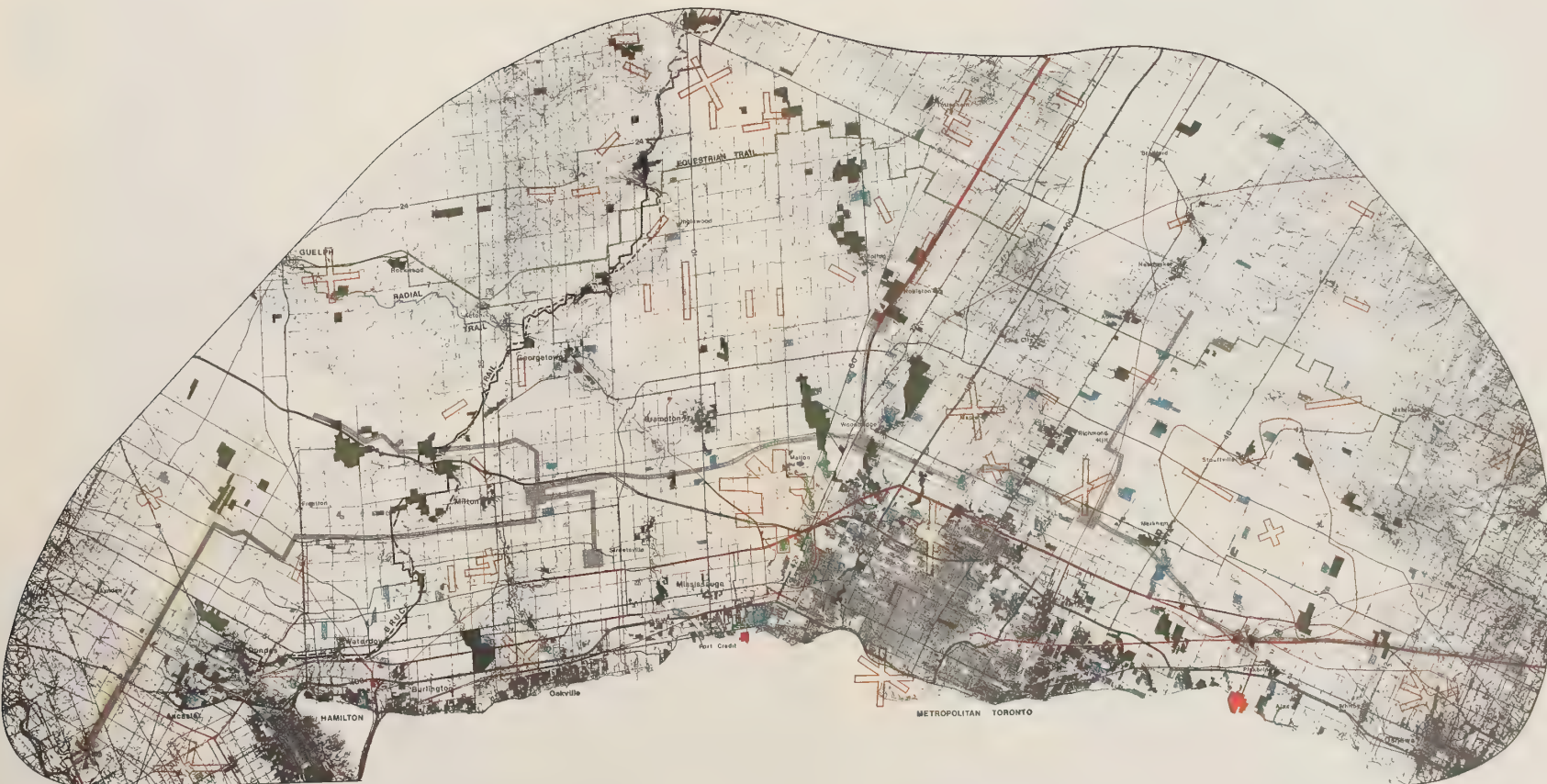
- extractive industry
- institutional
- airport, airstrip
- communication tower
- general agriculture
- intensive agriculture
- tree or vine fruit crop
- solid waste

PREFERRED ROUTE

SUBSTATION







# An Environmental Study

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**bhi**  
LIMITED Environmental Planning Consultants  
Toronto, Ontario, Canada August 1973



## 2 CULTURAL, RECREATION & OPEN SPACE

- provincial parks & park reserves
- conservation authority lands
- regional park
- golf course
- other recreation area
- trails
- cemetery

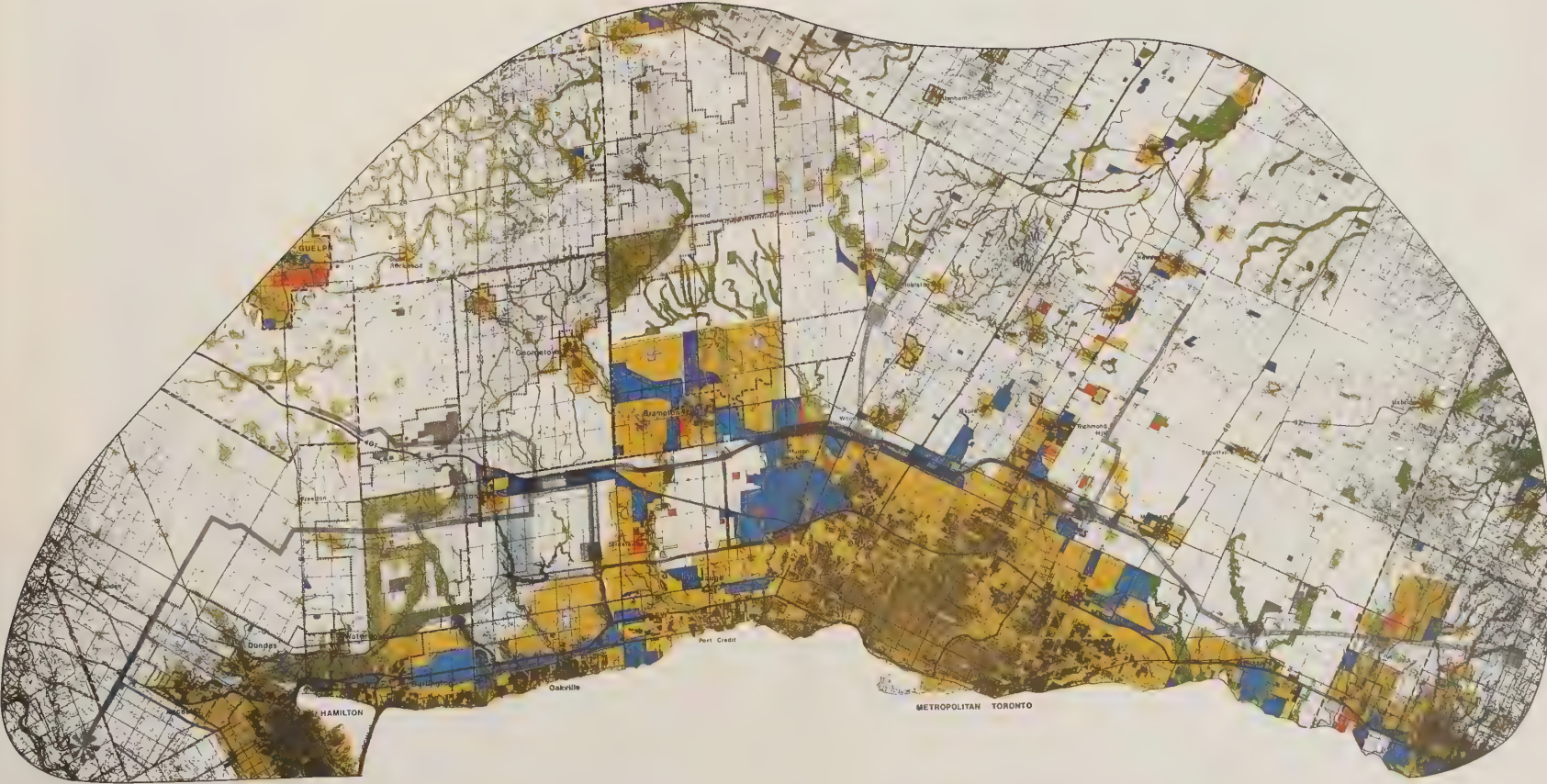
## 3 TRANSPORTATION LAND USE

- provincial highway
- proposed expressway
- gas & oil pipeline
- railroad
- abandoned railroad
- Hydro Transmission R.O.W.
- fully built
- open
- planned addition
- airport influence zone

— PREFERRED ROUTE

■ SUBSTATION





# An Environmental Study

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## 4 PROPOSED LAND USE

- MUNICIPAL OFFICIAL PLANS  
approved ——— draft ——— proposal
- residential & urban areas
  - commercial
  - institutional
  - industrial
  - extractive industry
  - open space & restricted area
  - agricultural or rural

- REGIONAL PLANS
- proposed airport
  - proposed north pickering community
  - potential regional park
  - central ontario joint planning board
  - Parkway Belt West with service corridor delineation
  - Niagara Escarpment Planning Area
  - proposed landfill site

- PREFERRED ROUTE
- SUBSTATION







## An Environmental Study

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**bhi**

Environmental Planning Consultants  
Toronto, Ontario Canada August 1973



### 5 NATURAL RESOURCES

- wooded areas (20-60 feet)
- mature forest (over 60 feet)
- county & agreement forest
- Agricultural Capability
  - class 1
  - class 2
  - organic soil

— PREFERRED ROUTE

■ SUBSTATION

BASE MAP SOURCE: department of energy,  
mines and resources.  
ORIGINAL SCALE: 1-50,000





## An Environmental Study

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scale in miles  
0 10 20 30



### 6 CRITICAL NATURAL FEATURES

- flood plain\*
- steep slopes\*
- water
- wetland & marsh\*
- sensitive natural site

\*Where extent of flood plain mapping available from the Ministry of the Environment

### 7 SCENIC QUALITY

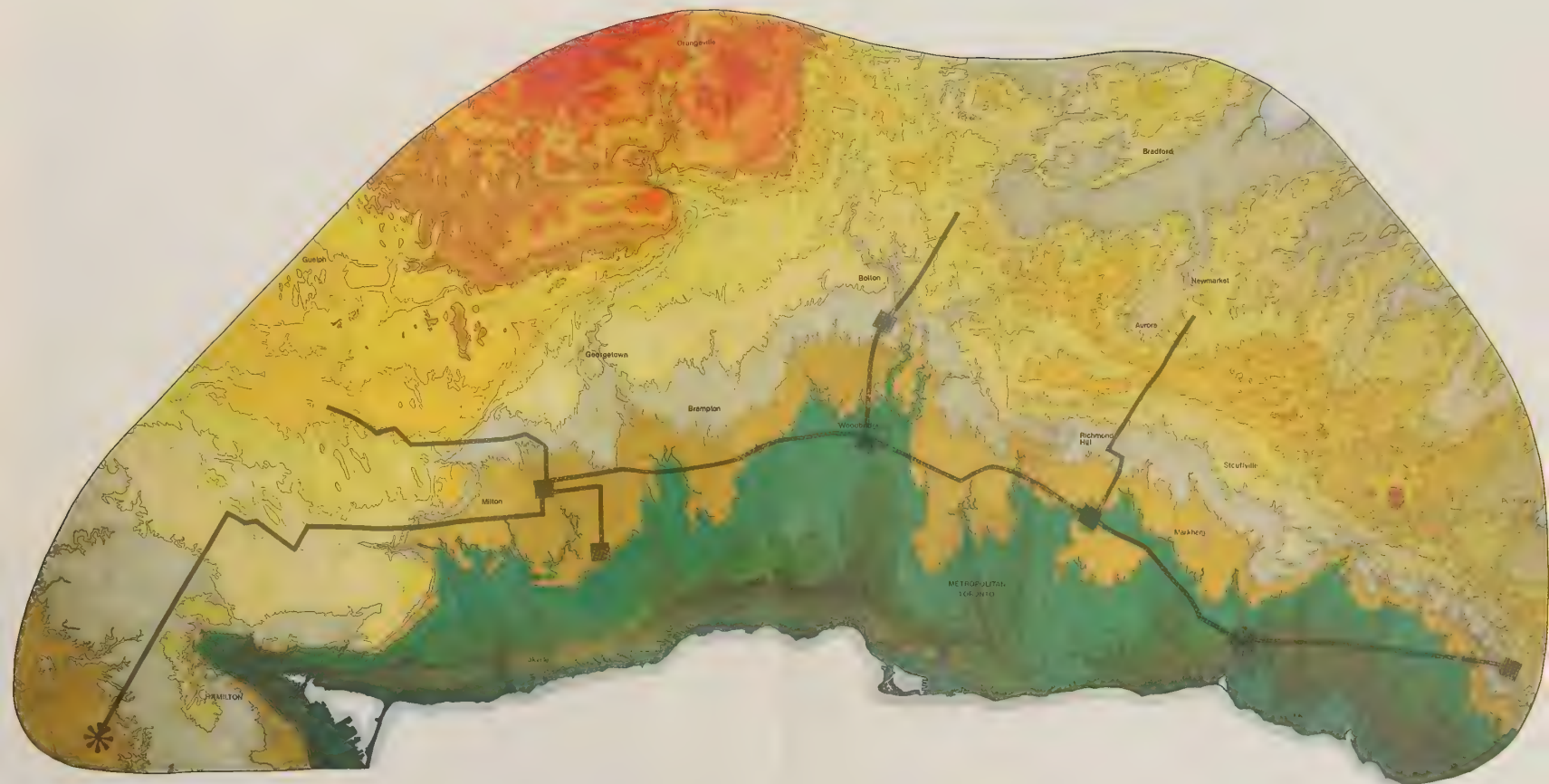
- major river system
- wetland area
- lake
- upland stream & pond
- Niagara escarpment
- scenic outlook
- diverse landform
- urban area

PREFERRED ROUTE

SUBSTATION







## An Environmental Study

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for **The Solandt Commission**

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SCALE 1:50,000



### 8 LAND ELEVATION\*\*



\*\* In 100 foot contour intervals above mean sea level

— PREFERRED ROUTE

■ SUBSTATION





# The Public

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# The Public

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The terms of reference for this study include public involvement in the process of planning for the Middleport-Pickering corridor. To satisfy this requirement, a program was prepared to involve the public at each stage of the study. The program consisted of three sets of public meetings at widespread locations throughout the study region, keyed to separate stages of the work; publicity in the form of press releases, press conferences and official notices; distribution of questionnaires to ascertain public sentiment at two points in the study; creation of citizen committees to look into transmission tower design and substation design; requests to citizens and citizen's groups for information on points or areas deemed of local environmental significance; initiation and maintenance of a mailing list to inform interested persons and groups of study progress.

## Meetings

Three series of public meetings were held, at Queens Park and in communities throughout the study area. The first series of meetings, held February 19 to 22, at five locations, were designed to acquaint people with the study and to ask for their participation. The purpose and methods of the study were explained and people were invited to contribute information about environmental features of their area which they considered significant to the study. A second series of meetings, held March 26 to 30, again at five locations, presented nine large scale inventory maps showing the environmental data which had been collected, after which people were asked for comments

and additional information. The third series of meetings was held in ten locations from June 28 to July 13. Minimum impact alignment alternatives were presented, with an invitation to people to express their preferences on maps and questionnaires; to propose modifications of any of the routes, and to add any further information to the study they thought would be useful.

## Publicity

Throughout the study, efforts were made in all media to secure full publicity of the study progress and of opportunities to participate. Regular news releases and progress reports were distributed to the media and a well attended press conference was held at the time the alternative routes were announced. Another press conference will be held at the time of the presentation of this report to the Solandt Commission.

Continued contact with every municipality was maintained from the beginning when a personal visit was made asking for their assistance both in collecting information and in informing local citizens about the study. A list of community organizations was requested for inclusion in a mailing list. Regular mailings were then made to all municipalities, every community group or association named and to a continually growing number of individuals who requested that their names be added to the mailing list. Advertisements of all meetings were placed in every daily and weekly newspaper throughout the area.



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# The Public

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## Questionnaires

During the course of the study, two questionnaires were used to obtain people's views. The first questionnaire, which included an explanatory brochure, asked people to rate or rank the importance of various environmental features thought to be significant in siting a corridor for the 500 kV lines. The results gave an indication of the relative weights the respondents wished to see applied to these physical factors. A second questionnaire was prepared, together with a map of alternative routes and systems, and distributed at the time alternate routes were proposed. This questionnaire asked respondents to indicate which electrical system alternate they preferred, as well as a route alternate which best followed the system they selected. Comments made on each questionnaire were reviewed and all recommendations and suggestions were recorded, including detailed comments and recommendations on any of the routes. In addition to these questionnaires, an evaluation form was used at the first two series of meetings to estimate people's satisfaction with the presentations and to obtain suggestions for improvement. All questionnaires provided a direct means for individuals to express their opinions on the study, and to give useful suggestions and recommendations.

## Citizens committees

During the first series of meetings in February, citizens interested in the design of towers or of substations were invited to become members of two citizen committees set up to consider these subjects. Ontario Hydro supplied

staff to assist the work of the committees and to provide technical information. The committees operated independently of B.H.I. Limited, and contributed considerable time and effort to their studies. The details of their recommendations appear in Part B of this report.

## Local environmental survey

In addition to expressing their views, individuals and groups were asked to assist in the inventory process by providing additional information on significant environmental features for their local area. Twenty-eight large scale maps of the region were distributed to volunteers who placed them in a publically accessible location within their community. A book was provided with each map for detailed comments. The media, municipalities, and community groups were supplied with information on the location of these local inventory maps and asked for their assistance in obtaining as much participation as possible. After the maps and books were collected, the information was mapped under the heading of Local Data Collection, Map 9, and incorporated into the study.

In addition, all letters received from individuals and groups were reviewed with comments and recommendations recorded. All additional information provided was checked and added to the inventory maps. The original submissions to the Solandt Commission were also reviewed in this manner. A detailed discussion of the aspects of public involvement in the study is included in Part B of this report.

# The Public

Mayor opposes

Hydro i

Two of the three proposals will be put through Vaughan

## Hydro Corridor

They'll be asking  
your opinion

Erin Township, east-west or north-south. It would follow the 401 Parkway and head north in the Cuelph area.

The Modified Q, which is growing in popularity, was the brainchild of John Schneider an Erin Township resident, who presented it first at the public meeting in Acton earlier this month.

(Continued)

(Continued on Page 10)

There are certain necessary facilities that everybody wants to put in somebody else's backyard. The proposed hydro line from Alid dieport to Oshawa is a perfect illustration of how people want to put something unpleasant somewhere else.

Unfortunately Ontario cannot continue to have adequate supplies of electricity without the

## Hydro issue

# Planner favors Town

"I suggest that each and everyone should show concern for this east west tower line that cuts a swath 610 feet wide through the Town or Township that the Howlett Consultant may recommend."

Mayor Williams went on to say: "I am very concerned that the King group will

Hydro corridor, qu

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say: "I am  
that the King, group who

Hydro corridor qu

(Continued from Page 1)

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positional  
TITLE

Most favor parkway  
route for hydro line

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Environmental Council  
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proposed 9m-  
make one-  
recommendation to  
annually sum-

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Omond Solandt w  
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# Hydro alternates sought

There are some no matter what route sub-station in the Don. That must be to serve north of Metro.

# PRO PLANS

# Preserve Beverly swam consultants on power

TORONTO — The Bel-mer of 1972 to investigate the  
ly Swamp will be pre-need for a power line skirting  
erved. Milton and Toronto and  
ecting Nanticoke with  
ering.

## Town to voice objection to hydro routing

BRAMPTON  
General committee has  
agreed with a suggestion  
Planning Director Len  
one to voice the town's  
ction to the Spaland  
mission's inclusion  
verall plan of  
linking route  
west side

As for the possibility  
the 500 kv line may run

along the proposed re-  
of Highway 407  
advised  
comm-  
se

# Public invited to choose route for Hydro line

Hydro.  
line to  
to a /

The public was invited yesterday to choose one of four main options open for the controversial Ontario Hydro 500 kilovolt transmission ~~line~~ route across southern Ontario.

At a Queen's Park press conference, Bruce Howlett, environmental consultant

# More Public Meetings On Power Line

series of public meetings is planned for next month on the route of a power line from west of Hamilton to east of Toronto. The line, connecting generating stations at Nanticoke on Lake Erie and Pickering on Lake Ontario, was the subject of a one-man inquiry commission last year.

# Discussions July 12

...Diamond Soland  
...last July at  
...mental groups r  
...the provincial  
...their in

# Claremont July 12

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# Governmental Coordination

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Continuous contact with governments and their agencies was of great importance to the study. In early January, at the request of the Solandt Commission, representatives were appointed by the Provincial Ministries which could supply data for the study. At each stage of the study, meetings were held with the Provincial Ministries involved, progress was reviewed and comments were received. A major portion of the inventory data base was obtained from provincial departmental offices. The co-operation of provincial agencies clearly reflects their recognition of the urgency of the study.

In addition, contact with the seventy-two municipalities in the study area was established in early January. Personal visits were made to the municipalities to explain the study and to ask for their co-operation and assistance in informing the public. Copies of all pertinent planning documents were also requested. Before each of the first series of regional meetings time was set aside to meet with local elected representatives. Contact was maintained with the municipalities at each stage of the study. Some municipalities expressed continued interest and concern throughout the study, designating staff to assist in the gathering of local information, to submit or sponsor the submission of local information. However, the majority of local governments did not assist in informing their citizens to any active extent, and became concerned only during the third series of meetings when it appeared their area might be directly affected.

In the week before the regional meetings of Series III began, two special meetings for the municipalities were held at Queens Park to review the route alternatives. Approximately 25% of the municipalities sent representatives to these meetings, which were intended to give advance notice to elected officials and their staff, in order that they would be able to comment intelligently about the alternate routes when approached by their local citizenry.

After determination of the proposed alternative routes, maps at 1:50,000 scale were supplied to the Provincial Ministries, and local government offices, and their comments and recommendations requested. The submissions received are discussed in Part B.







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# Analysis

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# Analysis

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## Regional Perspective

Within the broad region defined for this study can be found a variety of both natural and man-made environmental features that could be affected by a corridor. Metropolitan Toronto, for example, is often said to reach from Hamilton to Oshawa. A glance at the present land use map shows that within the boundaries of the study area there are indeed few open areas to be found along the Lake Ontario shoreline. This closely built-up urban belt virtually precludes consideration for a transmission corridor near the shoreline, for no room could be found without massive acquisition of already developed lands.

Moving north from the built-up areas of Hamilton, Metropolitan Toronto, and Oshawa, the natural landscape begins to reappear in river valleys and open agricultural land within which are found large towns and villages together with isolated pockets of suburban development. In this area the original grid layout of lot and concession becomes very apparent. Most man-made structures are found along roads, with new homes interspersed between original farm buildings. The further from the built-up lakeshore area, the more obvious the natural environment becomes. The physiography gradually changes into gently rolling hills, vegetation density increases from tiny farm woodlots to major forests and plantations with man-made features consisting of original farmsteads and an increasing number of estate-type developments. And on the western edge of the study

area, the major presence of the Niagara Escarpment stretches from Hamilton north to Orangeville, where it merges with the Oak Ridges Moraine in the Caledon and Albion Hills.

To satisfy the electrical system requirements for Ontario Hydro's proposed 500 kV grid, one or more transmission line corridors must cross the various types of landscape found within this region. The problem is to find the route with the least environmental impact.

### *The urban fringe*

Moving away from the densely built-up lakeside cities and towns within which a transmission corridor alignment would be impossible to find, the greatest locational constraint is the urban strip development pattern found along the major roads of many suburban areas. Yonge Street north is a typical example of a continuous man-made barrier stretching from the Metropolitan Toronto boundary to Newmarket. Transmission line crossings in these areas are dictated by the density of development and the space between structures, with the narrow spaces between built-up sections becoming possible locations for the transmission corridor.

Within the urban fringe, because dominating natural features are lacking, their influence in selecting a corridor location becomes less important than the existing pattern of urban and residential development and the proposed land use (official) plans of municipalities and Provincial

# Analysis

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agencies. The future development of these areas is largely being decided by governmental plans, not all of which are in harmony with each other.

Within a developing area, a high voltage transmission corridor should not be planned in isolation. With different impacts on differing land uses, a transmission right-of-way -- especially one of 610 foot width -- can influence development patterns for industrial, commercial, and residential use. While a corridor could be a buffer to residential communities, it may have negative effects in areas where it conflicts with, rather than complements a proposed development plan.

The Provincial Government's recently announced Parkway Belt is an example of a proposed buffer which has been planned specifically for utility corridor uses. The Parkway Belt has been designed in conjunction with existing and proposed linear land uses such as highways, railways and Hydro rights-of-way, many of which already influence the direction of new development. Within the urban fringe, to co-ordinate future transmission facilities, reference to local and official plans is important.

## *The agricultural hinterland*

The large agricultural hinterland around Metropolitan Toronto including Peel, Halton, York and Ontario Counties, represents some of the finest rural landscape in Southern Ontario. Its importance is heightened by the area's high capability for agricultural production and its proximity to the population centres of Southern Ontario.

Farmers, represented by the Ontario Federation of Agriculture, have been vocal in deploring what they feel is a lack of concern for this diminishing resource. While it is often stated that high voltage power lines do not interfere with agriculture land use, that view is not generally shared by the farming community.

Technological advances in farming methods have drastically reduced the number of small family farms and created large farming organizations in which the economic aspects of production are paramount. Whereas a single towerline through a single family farm with small fields

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# Analysis

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and numerous fencerows may not create a major obstacle, a multi-tower line through intensively farmed agricultural area could reduce efficiency.

Farmers have documented the points they feel are important in locating a transmission line in agricultural areas, if it should become necessary; these are included as an appendix to this report. Some concerns are of a detailed nature and relate to the location of towers with respect to lot lines and fences, so as to reduce the impact of towers with respect to farming operations. Others are of a more pervasive nature and concern compensation and right-of-way maintenance operations.



The Ontario Government has recently taken steps to ensure the preservation of good agricultural areas in Southern Ontario through land use planning controls. Similarly, recognition is being given to Provincial scenic resources such as the Niagara Escarpment where new controls over development have been enacted. Through these plans, the intrusion of non-farm activities into agricultural areas should be reduced.

Wherever Hydro's electric system alternates require crossings of agricultural lands in order to line two stations, as they would in Halton and Peel counties, minimum impact routes were selected to satisfy these system requirements. In order to reduce possible impact in these areas, the existing grid pattern of lot and concession formed a strong locational control. Following this pattern reduces the number of property intersections, and places the right-of-way alongside lotlines, thus preserving the visual integrity of the rectilinear pattern of fencerows, roads, and woodlots.

Within the agricultural hinterland, other locational constraints, such as natural features, are comparatively few. The major river valley systems pass through a generally flat landscape with little topographic influence. An important consideration in agricultural areas however, is the potential for urban expansion designated by municipal plans. The acreage of prime farmland being absorbed by urban growth is extremely large in relation to the lands required for a transmission corridor. The



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# Analysis

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concerns which farmers place on preservation of rural areas from Hydro lines might also be directed towards the municipality and its plans for urban expansion.

## *The niagara escarpment*

"The Niagara Escarpment is one of the major natural features in the landscape of southern Ontario. This Escarpment is a unique environmental corridor stretching from Queenston, near Niagara Falls, across the expanding urban belt and rich agricultural lands of southern Ontario to the tip of the Bruce Peninsula near Tobermory. It is a rich mosaic of forests, cliffs, hills, waterfalls, scenic viewpoints, unusual rock formations, and interesting plant and animal life. In its southern portion, the Escarpment is the site of a multi-million dollar extractive industry. Expanding urban, recreational and industrial development are subjecting the Escarpment to a number of undesirable pressures."\*

The study area encompasses a good portion of the Niagara Escarpment and it therefore became an important locational control in the selection of possible alternate corridor alignments. After applying Hydro's electrical system requirements to the study area, it was apparent that two crossings of the Niagara Escarpment would be required in all cases.

In studying the location for a good crossing of the Escarpment, the original "Criteria for Selection" in the Gertler Report of 1968 outlines the most significant natural

characteristics to consider for preservation. They are as follows: (1) Rock Face or Outcrop; (2) Slopes of 12 percent or greater at the toe; (3) Unproductive soils associated with the Escarpment that should be left in natural vegetation; (4) Bottomlands and Wetlands close to or crossing the Escarpment; (5) Natural Vegetation areas of importance to the protection of soils and stream headwaters or of importance for purposes of scientific study; (6) Wildlife habitat of importance to the production of game or for scientific study purposes; (7) Natural Landforms; (8) Viewing Vantage Points.

Within the study area, the Escarpment lands exhibit all of these characteristics at one place or another. The most limiting natural factor is the steep rock face which in this region occurs along a good distance of the Escarpment. This presents a physical barrier to a transmission corridor. Allowing the lines to cross in these areas would create a very significant and undesirable visual impact since the towers would be placed in full view of the surrounding countryside. Destruction of the natural pattern of ridge vegetation would increase the impact. Suitable crossings of this natural barrier are therefore substantially reduced. The Task Force recommended

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\* Development Planning in Ontario: The Niagara Escarpment, Ministry of Treasury, Economics and Intergovernmental Affairs, June 1973.

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# Analysis

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that the fundamental goal, or purpose, of any policy for the Escarpment should be:

"To maintain the Niagara Escarpment  
as a continuous natural environment  
while seeking to accommodate demands  
compatible with that environment"\*

Therefore, one of the most obvious crossings perhaps is the point where the Highway 401 passes through the Escarpment at Campbellville. This location is bordered to the north and south by steep Escarpment faces, with Highway 401 passing through a gap between them. At this point, the 401 corridor represents an already existing impact on the Escarpment and creates a functional and ecological bisection.

In addition, other elements of human intrusion such as the Kelso reservoir, a proposed reservoir, as well as recreational and extractive operations, reduce the natural significance of this area of the Niagara Escarpment suggesting that a suitable location for a corridor may be found.

Of course, there should be some concern for the traveling motorists' exposure to the Escarpment as he drives in Southern Ontario; the Niagara Escarpment pass is no doubt one of the important scenic experiences. It is at this point that the Escarpment is known to many people and the transmission corridor, if improperly located, could have a significant impact on their appreciation of this scenic resource.



Another potential location for a corridor crossing of the Escarpment could be in the area adjacent to Mount Nemo and Rattlesnake Point. Here, a natural depression exists between exposed Escarpment faces through which the lines might pass with the least disruption to the visual character of this landscape. The Escarpment on either

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\* Development Planning in Ontario: The Niagara Escarpment, Ministry of Treasury, Economics and Intergovernmental Affairs, June 1973.

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# Analysis

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side could form a backdrop for the lines and towers when viewed from areas below the Escarpment. From adjacent high points where views extend as far as Lake Ontario and Toronto, it is felt that these views would not be substantially impaired by the power corridor because of its location well down in the pass area. This vicinity, however, exhibits unique contrasts between natural communities and man's use of the land for agriculture and recreation.

To the north, the physiographic demarcation of the Escarpment is less pronounced, particularly near Limehouse, where rock outcroppings are minimal. Here, several quarries are found on and adjacent to the Escarpment edge with dense vegetation both at the toe and top of the slope characterizing the landscape. Because there is no steep rock face in this area, a comparatively low impact crossing is feasible. The greatest impact however, is not the point where the lines would actually cross, but along the north-south length, since it would be necessary to parallel the Escarpment lands for some distance.

Moving further north to the Cheltenham-Inglewood areas, the Escarpment changes in character as it merges with the Caledon Hills. The land elevation increases considerably and one of the most dramatic panoramas of the total Escarpment appears at the Forks of the Credit. A transmission corridor in this area, designated as one of the most scenic along the Escarpment and now being

developed into a Provincial Park, would represent an undesirable intrusion.

## *The oak ridges moraine*

Although not yet officially designated in Provincial planning policies, the Moraine is gaining recognition as a Provincially significant landscape resource, comparable to the Niagara Escarpment.

The Moraine, stretching from the eastern edge of the study around Lake Scugog to the Albion and Caledon Hills of the Niagara Escarpment, differs noticeably from the adjacent flat agricultural plain. Rolling hills, densely



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# Analysis

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wooded, often of pine plantations, interspersed with kettle lakes and small farms create a scenic landscape within easy reach of Metropolitan Toronto. Its potential for recreational development and compatible low density uses such as rural, residential communities increases its significance for preservation.

Although the Moraine has no dramatic physiographic characteristics such as the precipitous rock face of the Niagara Escarpment, its variety of landform in combination with natural features of vegetation, rivers, lakes and wetlands produces a landscape character in which a 610 foot transmission corridor would be a major intrusion.

## **The process of selecting routes**

Within the study region, just described with its vast array of important man-made and natural features, the selection of an acceptable alignment for a transmission line corridor can be an intricate and complex process. In its simplest form, the process involves the following steps:

- ranking or weighting all the inventorial environmental data in terms of the degree of impact a transmission corridor might exert
- selecting several alternative routes which have a minimum impact and which satisfy Hydro's electrical system requirements
- determining the best route among the several selected on the basis of environmental impact, dollar cost, public opinion and the comments of Provincial agencies and municipal governments



# Analysis

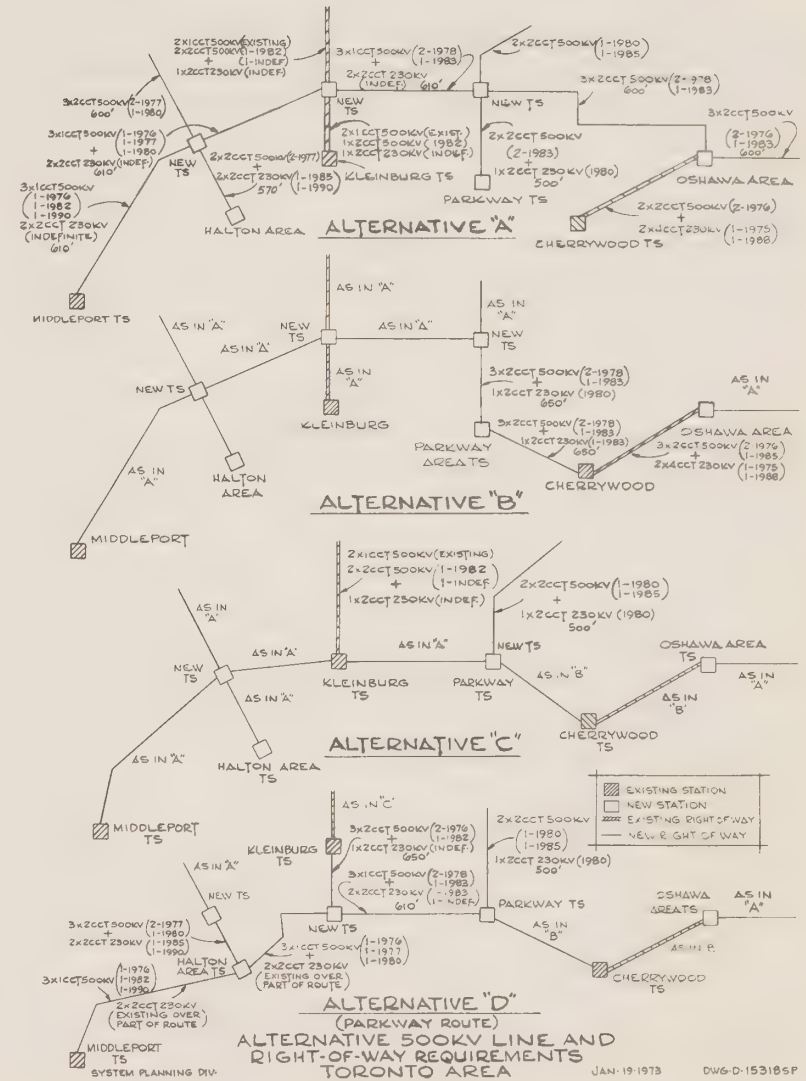
## Systems options

From the system standpoint, several different routings are possible. To provide some guidance on the system possibilities, Hydro prepared a schematic diagram showing four alternate systems, indicating that other combinations were theoretically possible. Hydro's diagram, which is reproduced on this page, indicates the range of opportunities available for route selection.

An analysis of the alternate systems presented by Ontario Hydro reveals that the location of transformer stations has a great bearing on the location of alternate routes. The existing stations at Middleport, Cherrywood and Kleinburg are fixed locational factors. For new transformer stations, engineering criteria, in addition to environmental factors, dictate possible locations. Basically, their criteria are: (1) proximity to the 230 kV system to which the 500 kV lines must connect; (2) future lower voltage connections to major load centres; (3) access by means of railway and/or county or township roads; and (4) of course, potential corridor locations for the 500 kV lines which connect to them.

Once transformer stations have been located therefore, the problem becomes one not of selecting a single corridor between Middleport and Cherrywood, but rather finding locations for individual segments of that total system between various substations.

In finding sites for substations, the location of the south-



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# Analysis

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erly stations close to Metropolitan Toronto and Hamilton was governed primarily by their relationship to the 230 kV system to which they must connect. Halton Station, for example, should be located adjacent to the existing 230 kV system in Halton County south of Highway 401. If the 500 kV system is not brought into a transformer station directly adjacent to this 230 kV system, then a great number of 230 kV lines would be required instead to make the connection.

The Woodbridge station is located on a north-south 230 kV line which connects to Kleinburg Station. The most easterly station, called Parkway is also located close to the 230 kV system serving eastern Metropolitan Toronto.

The northerly stations of Georgetown, Penville and Newmarket are primarily switching stations to interconnect north-south and east-west lines. They may have some transforming equipment to distribute power to the local areas, however, they do not appear to be required with a southerly configuration.

In addition to the flexibility in route selection presented by the system alternates, Hydro's system diagrams show that other options are available to help reduce or minimize overall impact. Total line length is shorter on some systems than others; fewer substations are required in some cases than others; and some options have less lines required in the Seventies than others.

## Right of Way

Under equivalent environmental conditions, a smaller right-of-way width is preferable to a wider one. The impact would be less.

There are several options for narrowing the width of the right-of-way, the first being tower design. If two circuits (six wires) can be carried on one tower rather than two, right-of-way width can be reduced. But double circuit structures are higher, and what is gained in reduced right-of-way appears in tower height. In their considerations, the Tower Design Committee reached the conclusion that double circuit towers were preferable, feeling that the extra height of double circuit towers would make no significant difference in visual impact, tower heights already being considerable.

The width of right-of-way can also be reduced when very constrained conditions are encountered. Hydro indicated that towers could be placed closer together if the right-of-way were to pass between buildings, for example, or at other restricted locations, such as near airports. However, some difficulties in maintenance would occur in these cases.

A third opportunity for narrowing the right-of-way is by using compact towers (present towers are designed to keep wires far apart so they cannot blow together in windstorms and short out). Hydro has pioneered in the development of compact structures that are both lower

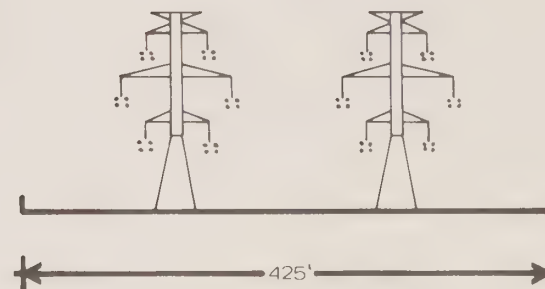
# Analysis

and more closely spaced than conventional towers. Although further work needs to be done, Hydro is already upgrading existing lines following the technology they have developed and there is every reason to believe that this technology can be applied to the lines in this study, allowing sufficient time for trial and development at voltages up to 500 kV.

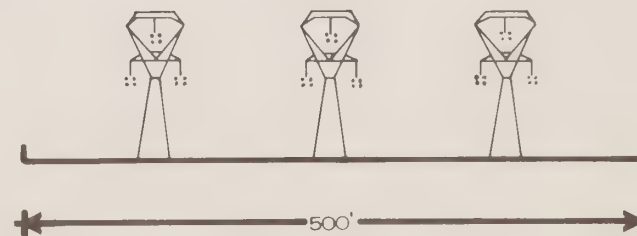
A last option for reducing right-of-way width is undergrounding. Undergrounding is expensive, sometimes prohibitively so, and Hydro is reluctant or opposed to using it in such key links in their system as the Middleport-Pickering line. Underground 500 kV, while now proven, has not been tested in service for long lengths. This will not always be the case, and in looking to the future, in later years of the time span included in this study, undergrounding may become much more realistic at 500 kV, at least at difficult points. Underground at 230 kV has much more service experience to back it, but is still much more expensive than overhead.

Even if the lines were underground, a right-of-way would still be needed. The width could be reduced below that required for overhead lines, but there would still be environmental problems. The visual impact of the towers would be gone, but trees would have to be cut and the right-of-way kept clear in case of cable failures. In sensitive biological areas such as erosive soil areas and river crossings, undergrounding could possibly create greater impacts than overhead, particularly during con-

struction. There is an advantage to undergrounding however, for in some cases underground lines could be placed between towers along existing rights-of-way.



DOUBLE CIRCUIT 500 KV TOWERS



SINGLE CIRCUIT 500 KV TOWERS

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# Analysis

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## Weighting

Earlier in this report a list of inventory maps was set out defining the environmental features that must be considered in selecting a minimum impact location for the transmission corridor. There are close to seventy items recorded on the maps, not all of which are equally significant in selecting a route. Some are certainly more important than others.

The questionnaire which was widely distributed throughout the study area during the early phases of the study asked respondents to indicate the relative significance on environmental features in terms of the degree to which a future transmission line should try to avoid them. The returns, while considerably smaller than the total distributed, nevertheless proved valuable.

Tabulations of the returns clearly showed that respondents see existing Hydro lines, railroads, or pipelines as potential corridors for new lines; and that corridors can run alongside expressways despite their visibility to motorists. Existing residential areas were regarded as the most important feature to avoid, followed by areas of high scenic quality and parks. Least important to avoid were industrial and commercial areas. More or less equal importance was given to a variety of other environmental features and respondents did not indicate that avoidance of high land costs was of particular importance. Nor did avoiding conflicts with the Toronto-Centred Region Plan or local official plans rate high.

The results of the questionnaire tabulation -- with some adjustments based on professional judgement -- were translated into mapped form to aid in the selection of a corridor route. By remapping all the factors shown on the inventory maps into shades of grey (with the darkest areas being the most important to avoid, and with the areas of least constraint shown lightest), a composite map was prepared. In selecting alignments, the object was to avoid the darkest areas to the greatest extent possible and thereby the areas in which the greatest impacts will occur, and yet try to follow existing Hydro lines, railroads, pipelines or expressways. In some cases, inventories involving large areas such as high capability agricultural land and scenic quality, were not mapped on the weighted overlays; instead the original inventory maps themselves were used.

A list of inventory factors and their weights is included in the Appendix. A portion of the analysis map prepared by applying weights to the factors shown on the inventory maps is shown in the illustration on the next page.



# Analysis

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Figure 6: Sample of shaded overlay maps with weighted information shown in combination.

# Analysis

## Route selection

In selecting alternate routes to satisfy the requirements of each of the electrical system alternates presented by Hydro, we began by finding general locations for substations, following the locational criteria provided by Hydro. Next, the principle north-south barriers of Yonge Street and the Niagara Escarpment were studied to find places where they could be crossed. Then, utilizing combinations of inventory and analysis maps, alternate routes between substations were selected with the object of avoiding developed areas and homesites, avoiding or minimizing impacts on natural resource areas, prime agricultural land, open-space uses and scenic areas, minimizing conflicts with municipal official plans and other plans, all the while endeavouring to follow pipelines, railroads, highways and existing Hydro lines wherever they did not conflict unduly with environmental values to be avoided.

Sometimes several possible alignments were found between substations and often, parts of routes that satisfied one electrical system alternate could be used to satisfy another electrical system.

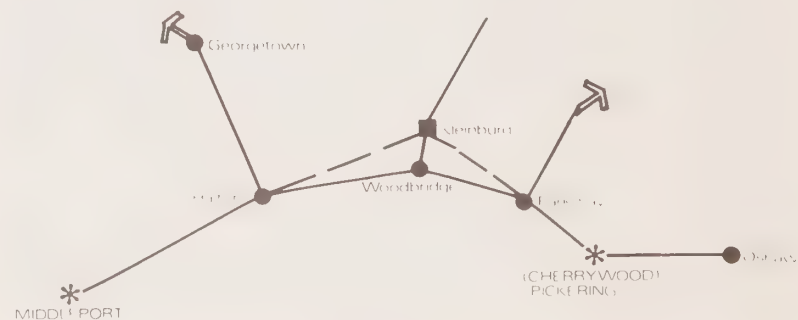
## Alternate route descriptions

Prior to the establishment of the Solandt Commission, Ontario Hydro had already acquired a right-of-way north from Middleport through the Beverly Swamp to Puslinch. Analysis of this area indicated that few significant environmental impacts occurred on this route except for crossing the Beverly Swamp. People had already been dis-

placed by the right-of-way and it seemed therefore that this would be a suitable route at least as far as the Beverly Swamp. On this basis, this part of the route is shown as a common link in all the alternate systems.

The connection between Cherrywood and Oshawa is also common to all systems and consists of the existing Hydro right-of-way for the Gatineau line which Hydro intends to rebuild to accommodate the 500 kV lines that are required.

## System Q



This most southerly system would require three new substations along the east-west connection:

- Halton - southeast of Milton on the 230 kV system
- Woodbridge - west of the village of Woodbridge south of Highway 7 on the north-south 230 kV line

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# Analysis

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Parkway - south of Highway 7 and east of Woodbine Avenue

The links from station to station would be as follows:

- (1) Middleport to Halton: This link has two distinct alternates, both of which begin by following the existing Hydro right-of-way from Middleport north to the Beverly Swamp. From this point, one route passes south of Freelon, north of Carlisle and Kilbride, joining a gas pipeline right-of-way to pass through the Escarpment Gap south of Rattlesnake Point and then into the Halton Station.

The other possibility connects to a point on Highway 401, west of Campbellville, thence along the highway alignment through the Escarpment to Halton Station. Variations of this connection are numerous in the Freelon area.

- (2) Halton to Woodbridge: This alignment essentially follows the Parkway Belt. Between Halton and the point where this route crosses 401 west of Meadowvale, there are two possibilities each following existing rights-of-way, one of a gas pipeline and the other a Canadian Pacific Railway line.

East of 401 to the Woodbridge station the route

follows the proposed Highway 407 alignment and passes north of Malton crossing Highway 50 north of the Claireville Reservoir and Highway 27 just south of Highway 7.

- (3) Woodbridge to Parkway: From Woodbridge Station the alignment would follow the CNR by-pass east to Bathurst Street where it would loop north of Langstaff following the proposed 407 alignment across Yonge Street and into Parkway Station.

- (4) Parkway to Cherrywood: Between these two stations there are various options. The most southerly connects to the existing Finch Hydro right-of-way and the most northerly follows the Parkway Belt as far as Highway 48.

One variation in this system involves linking directly between Halton and the existing Kleinburg Station, thence to Parkway Station, eliminating the Woodbridge site.

- (1) Halton to Kleinburg: One of the possible routes branches off from the Halton-Woodbridge link north of Malton and runs north to Kleinburg through Toronto Gore. Other possibilities run west and north of Brampton.

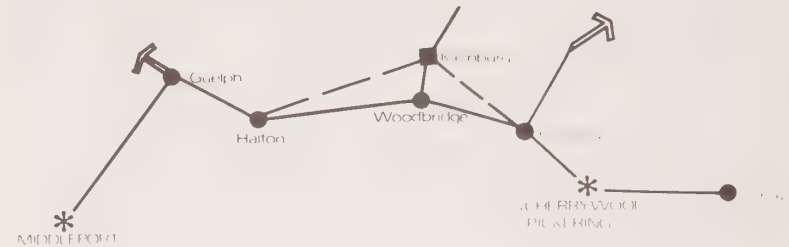
# Analysis

- (2) Kleinburg to Parkway: Between these two stations there are variable options south of King City with two possible crossings of Yonge Street south of Oak Ridges. From here, there are two alternates which skirt Buttonville Airport, one following an existing transmission line.

The north-south connections of system Q would require two stations: Georgetown and Kleinburg.

- (1) The Halton to Georgetown line would run north from Halton through the Escarpment at Limehouse to one of three possible station locations at Limehouse, Ballinafad or Crewson's Corners.
- (2) The line north from Woodbridge would be an expansion of the existing right-of-way through the existing Kleinburg Station.
- (3) The most easterly north-south route would parallel the proposed Highway 404 alignment, or an existing power line.

## System R



This system is one which was not provided by Ontario Hydro but which evolved from a search to reduce the impact on the Escarpment by having only one crossing. It is basically similar to System "Q" except that the links would be from Middleport to a new Guelph transformer station in the area of Highways 6 and 401. From there a connection would run to Halton Station.

- (1) Middleport to Guelph: This route would follow the existing Hydro right-of-way as far as the Beverly Swamp where it would run east and north with various options in the Freelton and East Flamborough areas. From there it would run west of Mountsberg Reservoir and connect into one of the two possible stations near Highway 401.
- (2) Guelph to Halton: This route would parallel Highway 401 from a point east of Highway 6 to Milton and then connect into Halton.





## An Environmental Study

to select **Hydro Transmission Corridors**  
for **The Solandt Commission**

**bhi** Environmental Planning Consultants  
LIMITED Toronto, Ontario Canada August 1973

scale in miles  
1:100,000

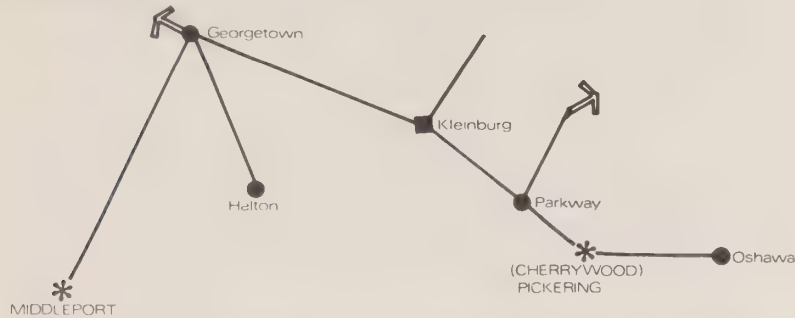


**Alternate Routes**  
for **Transmission Corridors**



# Analysis

## System S



This system follows a more northerly route passing through the existing Kleinburg Station and requires three new stations: Georgetown, Halton and Parkway. The links in this system are as follows:

- (1) Middleport to Georgetown: There are three possible locations for a Georgetown substation with numerous alternatives to connect Middleport and Georgetown. The westerly possibilities run southeast of Arkell, Eden Mills and Rockwood. To connect to a possible Limehouse site there are a number of options through the Sodom and Sayer Mills areas, closer to the naturally wooded lands of the Escarpment.
- (2) Georgetown to Kleinburg: This line crosses the Escarpment north of Limehouse and continues directly east across the Peel Plain north of Snelgrove to Kleinburg.

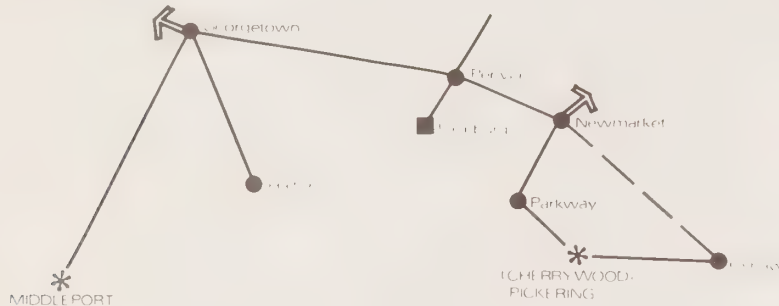
(3) Kleinburg to Parkway: Between these two stations there are several options south of King City with two possible crossings of Yonge Street south of Oak Ridges. From there, two alternates skirt Buttonville Airport, one following an existing low voltage transmission line.

(4) Parkway to Cherrywood: Between these two stations there are various options. The most southerly connects to the existing Finch Hydro right-of-way and the most northerly follows the Parkway Belt as far as Highway 48.

System "S" would require a north-south link between Halton and Georgetown. This line could run north from Halton through the Escarpment at Limehouse, Ballinafad, and Crewson's Corners.

# Analysis

## System T



This most northerly system is similar to System S from Middleport to Georgetown and Georgetown to Halton. The links to the east are: Georgetown to Penville, from Penville to Newmarket and then south to Parkway and on to Cherrywood.

- (1) Georgetown to Penville: This link would cross the Escarpment north of Limehouse and run north-east at the base of the Escarpment. From Ferndale the route would pass south of the Caledon and Albion Hills, crossing the Humber River south of Cedar Mills then into Penville Station, which is southwest of Lloydtown.
- (2) Penville to Newmarket: This route passes near Potageville and on to Kettleby where there are two possible alternatives. A northerly connection would parallel an existing

Hydro right-of-way south-east of the Holland Marsh, pass south of Holland Landing and then join a route along the proposed Highway 404 alignment.

The southerly connection would run east from Kettleby, south of Newmarket to one of two possible transformer stations in the Armitage area.

- (3) Newmarket to Parkway: From the two possible Newmarket stations there are two distinct alignments as far as Gormley, where they converge. The westerly route follows an existing Hydro right-of-way and the easterly follows the proposed Highway 404 alignment. South of Gormley there are two choices, one east and the other west of Buttonville Airport before connecting into Parkway Station.
- (4) Parkway to Cherrywood: Between these two stations there are various options, the most southerly of which connects to the existing Finch Hydro right-of-way and the most northerly follows the Parkway Belt as far as Highway 48.

An alternative to this system would be to line directly to the Oshawa Transformer Station from Newmarket, eliminating the link from Parkway to Cherrywood.



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# Analysis

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Newmarket to Oshawa: From a point on the proposed 404 alignment south of Vandorf the route would run east, south of Musselman's Lake, south-west of Goodwood along the south edge of the Oak Ridges Moraine, south of Ashburn and Raglan into Durham County. Just east of the County Line the route goes south to the proposed Oshawa site adjacent to the existing Hydro Gatineau Line.

With these various route options developed to satisfy any one of the electrical system alternatives presented by Hydro, the next step is to select the best one from many available. This selection process involved the presentation of the alternatives to the public, to municipal governments, to agencies of the Provincial Government, and to Ontario Hydro. All these bodies were asked to evaluate and comment on all the alternatives presented and to indicate which one they preferred. Each alternate was also analyzed in terms of the impact on each of the factors included in the environmental inventory.

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# Evaluation of Alternate Routes

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All of the alternatives for the Middleport-Pickering corridor were originally selected from the environmental inventories and analyses prepared for this study. Because the object was to minimize environmental impact at the outset, many potential environmental problems were avoided during the process of alternative route selection. But even though the process is designed to avoid most environmental problems, some impacts will occur no matter which route is selected. While impacts may be comparatively low, streams must be crossed, woodlands affected, and farms traversed in every case. The nature of the terrain is such that a few of these areas cannot be avoided no matter where a route is located. There are differences in total however, and some alternates tend to be slightly better than others on environmental grounds alone.

But in selecting the "best" route, while it is clear that a minimum environmental impact alignment should be sought, it is also essential that other factors be taken into account before a final choice is made. There is public opinion to consider for example, along with the views of private groups and local governments. The comments of Provincial agencies must be reviewed, together with the cost and engineering feasibility of the various alternatives.

There is no method whereby all of these various considerations can be added together and an overall numerical score determined for each alternate route.

The problem is more complex than that. For example,

while some people may consider farms to be the most important item, others may feel that marsh, woodlands and scenic values rank higher. And while some governmental agencies may indicate that the cheapest route is the best route despite its impact, other agencies may feel that the environment must be protected at all costs. There is no simple procedure for adding all these viewpoints together. Rather, by careful study of each point of view, hopefully a consensus can be found that will represent the best solution from all points of view.

## Environmental Factors

Because there were several possible routings for each of the three primary alternate system options, an elimination process was first adopted to screen each one to find the least environmental impact line. The least impact lines for each of routes Q, S and T were then compared to find the alternate with the lowest overall impact. The lowest impact route was found to be route Q. Route Q was later compared with Hydro's previously proposed middle route. A listing of those environmental features found on each alternate route is set forth in Appendix II.

A comparison of the environmental features encountered on alternates Q, S and T indicates that Q has considerably less impact on most natural resource features and tends to make more joint use of existing and proposed highways, pipelines and railroads than do the other alternatives. Alternate Q does have a higher impact on proposed official plans but as Q would be located in the Parkway Belt, conflict

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# Evaluation of Alternate Routes

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with local plans would no longer pertain since Provincial planning authority and land acquisition would supersede local controls.

## About Hydro's 'Middle Route'

The alternative routes developed in this study did not include Hydro's "middle route", which was presented to the Solandt Commission last year as Hydro's preference for the alignment. The middle route was not included as an alternative because it was felt necessary to be unbiased; not to be wedded to preconceived solutions; to start afresh. Otherwise, the study would have been little more than an evaluation of Hydro's middle and other alternative routes. The purpose was to proceed on a somewhat different basis to find if there were other routes different from those proposed by Hydro which may be better from the environmental standpoint. The results indicate that there are other alternatives which appear better in some ways. Had Hydro's middle route possessed significant environmental advantages, it may well have been identical to those selected under the process used here.

This is not to imply that Hydro's route is undesirable. In several instances, parts of Hydro's alternative are the same as those alternates which arose from this study.

An environmental comparison between the Q or Parkway route and Hydro's middle route indicates that Hydro has less residential areas affected and would be better than route Q in terms of impact on proposed land use. Hydro's

route would cross less rivers and streams and fewer floodplains. However, on most other counts Hydro's route ranks below the Q route in terms of environmental impact. Looking at all factors in total, the Q alternate ranks considerably better than Hydro's middle route.

## Public Reaction

Public sentiment toward each of the alternatives was obtained in three ways: through questionnaires distributed at public meetings and through the mail; through comments made during the question period at the ten public meetings held in Series III; and through submissions and phone calls received from individuals and groups.

In presenting the alternatives to the public, the underlying electrical systems needs were first described, based on information provided by Hydro. The basis for the selection of the alternate routes was next described through the use of slides and display maps. Every effort was made to indicate that there were different ways to solve the problem from the electrical standpoint and that these resulted in different routings on the ground. The public was asked to indicate what electrical system alternate they thought was best and then indicate which route best served the system they had chosen. They were also asked to comment on alternatives which passed through their area and to indicate where changes in routing might be desirable to reduce impacts of any kind, assuming that these alternatives were eventually selected.

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# Evaluation of Alternate Routes

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A great deal of highly useful information was obtained during this phase of the study. Not only did people indicate a general consensus as to the best route, but suggestions were made in the western part of the study area that resulted in reconsideration of the system alternatives originally presented by Hydro and the alternative routes that were selected from them. In particular, modifications to system Q were suggested which included reconsideration of alternative crossings of Escarpment lands. Additional data was also provided on sites and locations that would require rerouting parts of the line at other points in order to reduce impacts.

At a few places on the northerly alternate route T, some people felt the alignment should follow Hydro's previous choice as people were already conditioned to it due to actions undertaken by Hydro with local governments and land owners in the area prior to the Solandt hearings. In addition, some individuals in the south western portion of the study area wished to see the alignment follow Hydro's previous choice as far as Highway 401.

In general, the consensus view expressed by the public points to route Q where it follows the Parkway Belt. At some meetings, this choice was virtually unanimous and the prevailing sentiment was most clearly stated. Certainly part of this reaction must be ascribed to the desire of some to keep the line away from their home and community. But equally strong was the fact that the Government, only a short time before, had announced the design-

nation of the Parkway Belt along with the expressed intent to both control and acquire lands in the Parkway for purposes which explicitly include public utilities and Hydro lines. While no explanation was provided at public meetings by the representative of the Government as to whether the line could be included in the Parkway Belt or not -- it being made clear that all questions must await public hearings later in the year -- it was indicated by representatives of B.H.I. (from the limited data the Government had made public) that the allowance for utilities in the Parkway would not be wide enough to accommodate the Middleport-Pickering line in some places without expansion. Representatives of Hydro had indicated that this must be made clear by B.H.I. at each public meeting. Hydro also feared that the schedule for public hearings on the Parkway Belt would extend beyond their time limits for construction of the line if the Parkway were chosen as the best route.

At some meetings, people expressed the view that the Parkway be expanded to accommodate the Middleport-Pickering line and the Parkway hearings be accelerated to meet Hydro's needs.

## Group Response

A large number of groups and associations presented information and analyses to support their choice of route. While the majority of groups were largely concerned with local issues, a few other groups were broader in representation, and as such were concerned with a regional



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# Evaluation of Alternate Routes

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rather than a local viewpoint.

In evaluating the views of all groups, a general tendency was found toward selection of System Q where it follows the Parkway Belt as being the route with the least impact from several viewpoints -- natural environment, agriculture, and community disruption. Particular concern was expressed in several submissions for areas west of the Escarpment face and a number of independent groups evaluated the consequences of a new transmission facility in that area. In general, there appeared to be a consensus that the Highway 401 area would provide the best crossing of the Escarpment, and that crossings in areas to the north and south were not as desirable. Groups concerned with the area west of the Escarpment and south of Highway 401 suggested an alignment following Hydro's previous choice from Middleport as far north as the Highway. This resulted in restudy of alternatives to ascertain how best to traverse this part of the region.

In the central and eastern portions of the study area, suggestions were also made which helped determine the alternative with a lower impact on those areas. The importance of carefully crossing the Claireville Conservation Area in Toronto Gore Township was stressed, and recommendations for screening were also made. Several groups and many individuals felt that the alignment north from Woodbridge Station should be placed along the west side of the existing right-of-way in order to minimize impacts both on agriculture and the complex stream system of the

Humber River Valley. Other groups mentioned several sensitive natural sites in Pickering and Markham. Other suggestions were made regarding the alleviating of problems with particular road crossings in Markham and Whitchurch-Stouffville on the corridor alignment from Newmarket to Parkway.

## Municipal Government Response

Submissions were received from twenty-seven municipalities in the study area, many of which included detailed staff reports in addition to Council resolutions. While most municipalities recognized the need for the corridor and the importance of adequate electrical supply to the province, many were primarily concerned with the effects of alternative alignments on their particular jurisdictions.

Municipalities affected by Systems S or T preferred a route following the Q or Modified Q system, with utilization of the Parkway Belt as a prime feature. Municipalities affected by System Q generally preferred System T. It is interesting to note, however, that a number of municipalities in Peel County and York Regional Municipality affected by System Q stated their acceptance of a Parkway Belt alignment providing the problem of inclusion of the transmission corridor within the proposed width of the Parkway Belt could be solved.

Crossing the Escarpment in the area of 401 was preferred by municipalities north of Highway 401 in Halton County, and was noted as acceptable by several other municipalities

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# Evaluation of Alternate Routes

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outside the immediate vicinity. Municipalities in Halton County south of Hwy 401 were opposed to this crossing, or to any other south of the Highway. Municipalities in Wentworth County recommended that the alignment in their area utilize the route of Hydro's previous choice as far north as Hwy 401, with a 401 crossing of the Escarpment.

In the eastern part of the study area, the alignment north from Parkway Station to Newmarket Station parallel to the proposed Highway 404 was of particular concern as this highway forms a boundary for six municipalities in the Regional Municipality of York. While assuming the necessity of a north-south transmission alignment in this area, the responding municipalities expressed concern for potential impacts on both the east and west sides of Highway 404 and no consensus was evident.

A large number of the municipal submissions contained detailed comments on the impacts of various alignments both within and outside their jurisdictions. These comments and suggested treatment of problem areas were helpful in detailing a preferred alignment.

## Provincial Agency Response

Comments were received from several Provincial Ministries representing a broad spectrum of responsibilities. Comments and route preference varied between agencies as might be expected.

The Ministry of Transportation, while agreeing with the

joint use corridor concept in principle, pointed to some problems of implementation and restated the reasons for rejection of the Parkway route when it was considered in 1970. Concern was also expressed for the Highway 401 crossing of the Escarpment and a number of potential impact areas were listed along the routes of proposed highways 407 and 404. The Ministry of Consumer and Commercial Relations favoured joint use of Hydro lines with pipelines but felt that either the S or T routes would be best because of their lower cost.

The Ministry of Agriculture and Food felt that Hydro lines should be restricted to joint use corridors and preferably be located over lower grade agricultural lands. This Ministry recommended Route R (the route Q, Parkway route, with one Escarpment crossing) as best.

A detailed review of the effects of each alternate on official plans and zoning restrictions was submitted by the Plans Administration Branch, Ministry of Treasury, Economics and Intergovernmental Affairs. No route choice was made.

The Historical and Museums Branch of the Archives of Ontario favoured route Q, the Parkway Route, following a review of historic structures that might be affected on all alternative routes.

The Ministry of Natural Resources submitted a very detailed brief indicating that Route R, or Modified Route Q,

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# Evaluation of Alternate Routes

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(the Parkway route) was best. This route would avoid a number of significant and sensitive environmental features, particularly in the Escarpment and Oak Ridges Moraine areas. This Ministry felt that in addition to the environmental desirability of route Q, this route would demonstrate an ability to implement the Toronto-Centred Region concept. Because the Middleport-Pickering line would be built ten years in advance of proposed Highway 407, it was felt that excellent opportunities existed to minimize visual impact of Hydro lines on the motoring public through a variety of landscape development techniques.

A detailed submission from the Ministry of the Environment was received too late for inclusion in the selection and detailing of a preferred route. This Ministry presented a route of their own made up from portions of two alternatives. The route would proceed from Middleport to Georgetown, then across the Peel plain north of Brampton to a junction with the Parkway Belt which would then be followed from that point east to Cherrywood.

## Ontario Hydro Response

Hydro indicated it was willing to accept any route providing adequate consideration is given to environmental, engineering, social and economic factors and the lines can be constructed in time to meet the requirements of the power system. Hydro's submission presented a detailed review of schedule and time constraints, pointing to the need for expeditious approval of a route, particularly if

Route Q is selected. The results of Hydro's public attitude surveys on transmission towers indicated that few people were willing to pay for "improved appearance" towers. The costs of various types of towers was also presented together with a review of alternate locations for substation sites and suggestions for improvements. Comments were provided on all alternatives from the standpoints of cost, diagonal severances, agricultural land and forest resources. The Escarpment crossing, crossings of major watercourse and an identification of sensitive areas on each alternate was also presented. Possible use of the Parkway Belt was discussed, the proximity of lines to radio stations and airports was noted, and problems of paralleling highways were pointed out.

Hydro's criteria for the use of "improved appearance" towers was included, together with several diagrams which were used in reviewing the options, available prior to selection of the preferred route.

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# Evaluation of Alternate Routes

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## Cost Comparison

Data on costs for each alternate route was prepared by Hydro at B.H.I.'s request. This data is set forth in Appendix VII.

The least cost alternate, according to Hydro, would be Hydro's previously proposed "middle route", followed by "T", "S", and "Q" routes. Route "Q" is indicated as being most expensive. But to understand these costs more clearly they must be examined in detail.

The most expensive part of the total is "hardware" costs -- the costs of lines and substations. If these are singled out and added together, the cheapest route is system Q, the Parkway route, at \$229.5 million, with Hydro's middle route at \$236.4 million next lowest, closely followed by alternate S at \$238.9 million.

The major cost difference, according to Hydro (and the factor that appears to make their original route cheapest), is land cost. This part of the total cost ranges from a low of \$61.4 million for Hydro's route to \$134.5 million for the Parkway route. Here however, the differences may not be as great as Hydro indicates, for two reasons: first, the Government intends to buy land for utility use in the Parkway Belt in any event (although the width falls short of Hydro's needs in some places); and second, if advantage is taken of technological advances, the width of right-of-way required can be diminished (some future 230 kV lines are recommended to be placed underground

between 500 kV lines when needed in the 1980's, thereby reducing the amount of land required). The full impact of these adjustments is impossible to judge, but for the Parkway Belt portion of the route where the highest land costs are found, the reduction in acquisition expense could be substantial. The Government's plan for the Parkway Belt already calls for acquiring over half of Hydro needs, and if the total width requirement can be reduced, this could rise to include most of Hydro's need. And perhaps most important, when the Government already intends to buy land that could be used to serve Hydro's needs, it would appear to be a double burden on the people to have Hydro independently purchase land for the same purpose somewhere else.

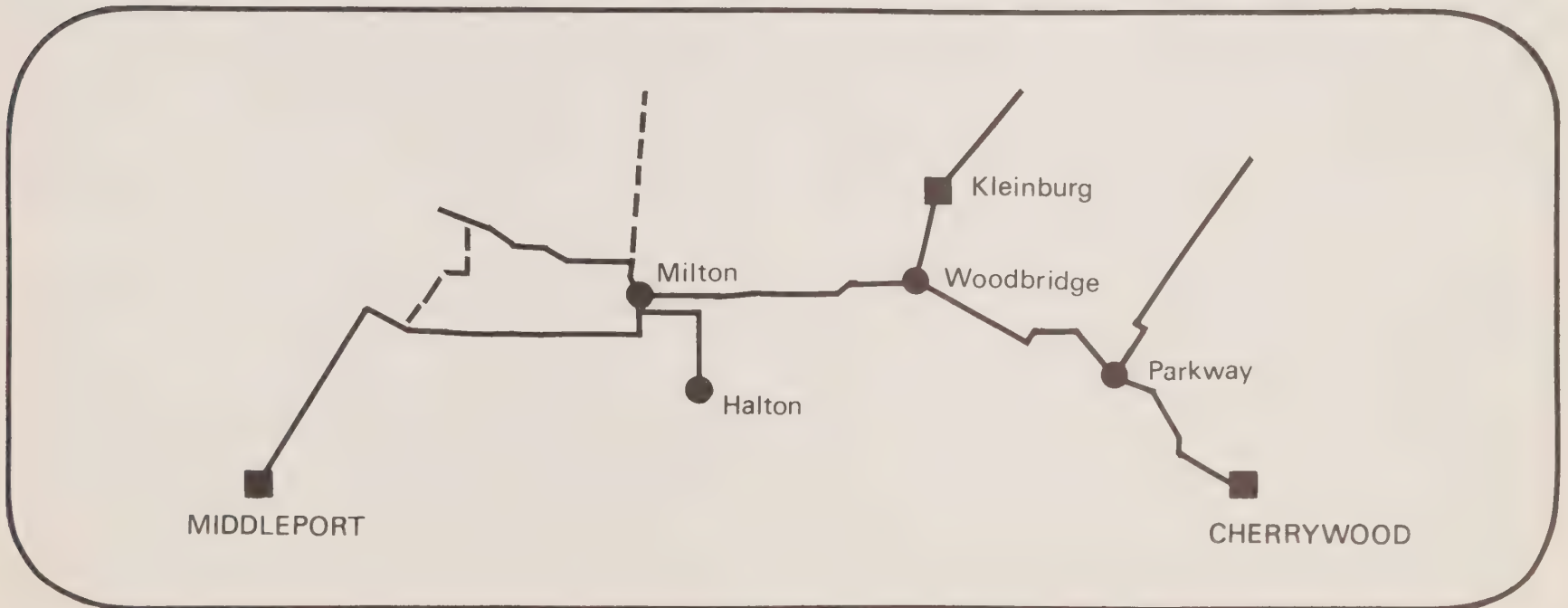


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## Conclusions

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# THE PREFERRED ROUTE



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# Conclusions

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## The Preferred Route

The Preferred Route is the Parkway Route. It is the shortest, has a comparatively low environmental impact, has fewer substations than the northerly alternate, is possibly the cheapest in overall cost, conforms to Provincial plans for future utility corridors, and is widely accepted by the public, by several Provincial agencies and local governments, and by a number of citizen groups.

The disadvantages of the Parkway route are higher costs for more "improved appearance" towers, possible higher costs for land, and the possibility of delay if the Government does not act expeditiously to permit Hydro to buy land in the Parkway Belt.

## Route Description \*

From west to east, the preferred route can be broken into three segments: (1) from the Bruce and Nanticoke power plants across the Niagara Escarpment to Halton substation, (2) from Halton through Woodbridge and Parkway to Cherrywood substation, (3) connections to the north from Woodbridge and Parkway substations. \*\*

## Bruce and Nanticoke Stations to Halton

Power from two generating stations, Nanticoke on Lake Erie and Bruce on Lake Huron, must flow to a Halton substation located southeast of Milton. Three ways were explored for making this connection.

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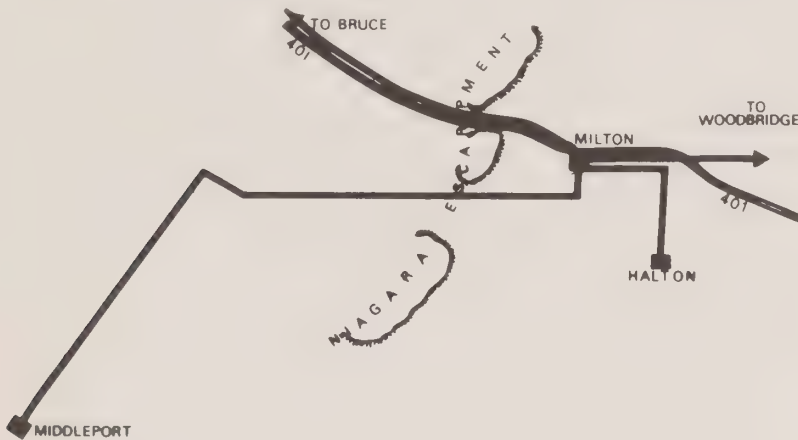
\* The preferred route is denoted as "Modified Route Q" and is identical to "Route R" except for the double crossing of the Escarpment described in the text.

\*\* Detailed maps of the preferred route are contained at the end of this section.

# Conclusions

## *First Option (Modified Q)*

The most southerly option is the preferred option and would require two crossings of the Escarpment, one south of Rattlesnake Point and the other via Highway 401.



The impact of these two crossings would not be the same. South of Rattlesnake Point, three 500 kV circuits are required; one in 1976, another in 1982, and a third not until 1990. The first two circuits could be carried on one tower alone. However, because of the visual sensitivity of this area, and taking into account the rapid advances being made in technology, it is recommended that for the portion crossing the Escarpment between Kilbride and Highway 25, that only a low, single pole, single circuit (preferably compact) tower be erected for the 1976 line, and that when the 1982 line is required, the overhead line

be removed and both lines be placed underground using Hydro's DAMUT system or conventional underground cable. If this recommendation is followed there would be no permanent overhead lines on this Escarpment crossing. When the 1990 line is required, it too should be placed underground in this area.

Two double circuit 230 kV circuits are noted as also being required for this crossing but the date needed is stated by Hydro as being "indefinite". While it is desirable to obtain right-of-way well in advance of need, and while power loads may eventually grow in this area requiring 230 kV service at some future time, it is recommended that every opportunity be taken to limit 230 kV service through this area and to use future technology in deciding what type of facility is preferred. In the Escarpment crossing area, 230 kV lines should be placed underground alongside the 500 kV circuits.

On either side of the Escarpment crossing, the requirements would differ. Beginning at Middleport, to the point where the line turns east alongside an existing pipeline, conventional double circuit lattice towers would be used for both 500 kV and 230 kV lines within the 610 foot right-of-way Hydro already owns. Turning east to Kilbride, it is recommended that one double circuit improved appearance tower line be built to accommodate both 500 kV circuits for 1976 and 1982. The 230 kV requirements, when needed, should be placed on compact towers so that the visual impact can be substantially reduced. Before 1990,

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## Conclusions

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when the third 500 kV circuit is required, a thorough review should be made with the object of placing this line underground if at all possible, thereby avoiding wider right-of-way and more visual clutter.

The same recommendation would apply for that portion of the line from Oakville Creek to the Milton substation. Hydro may wish to explore the desirability of extending the underground portion recommended in 1982 to connect directly to the station site. Otherwise, this part of the line would consist of one 500 kV improved appearance double circuit tower, accompanied by two 230 kV compact improved appearance towers. Depending on the time they are required, it may be possible to place the 230 kV circuits underground.

At the 401 crossing more lines are required than for the Rattlesnake crossing. Two double circuit 500 kV lines would be needed in 1977 with another in 1980. Two double circuit 230 kV lines are also needed, with the date noted by Hydro as "indefinite". A crossing at this point also assumes that Hydro can find a location for this corridor to the west out of the study area to the south or east of Guelph. Hydro is presently studying this possibility.

This Escarpment crossing, following the common corridor concept in being located adjacent to Highway 401, presents a potential visual conflict for the place where the crossing must be made can be seen by people travelling along 401. To reduce this conflict to the minimum, the

Escarpment crossing has been located well to the north of Highway 401, angling across the Escarpment on a slope, thence through an area already scarred by a quarry, continuing to the west through scattered woodlands which aid in reducing visual impact.

The recommendation for this crossing is for very low, single pole, double circuit towers to be used, and that they cross the Escarpment at a shallow angle with trees left between lines for concealment. Ontario Hydro is currently studying tower colour and it is suggested that this crossing become an experimental research area. Initially, it is recommended that towers located over the Escarpment be painted light grey or light blue for the portion visible against the sky, with earth tones for that portion below skyline view. The compatibility of these colours should be observed for one year throughout all four seasons and the towers repainted with different colours if deemed appropriate. The 230 kV lines required for this crossing at an "indefinite" future date should be underground using the DAMUT or other appropriate system and be located between towers providing that concealment vegetation can be maintained. It is also suggested that scattered plantings of trees along the north side of Highway 401 as it approaches within sight of the Escarpment may help reduce the visual effect of the transmission line crossing.

For that portion of the route west of the Escarpment along Highway 401, it is recommended that the lines be located



# Conclusions

to the north of the highway for some distance so as to avoid residences, historic homesites and other developments that cluster on and near the north side of the road. In addition, the presence of existing trees and vegetation in this area will aid in concealing the view of the towers from the highway. Depending on the number of homesites in this area and concealment of the line from view, lattice structures may be appropriate.

The details of locating the route across the Escarpment and along Highway 401 go beyond the recommendations of this report. Site scale study will be required to refine and detail the alignment and ensure that the least impact occurs to the motoring public, to conservation and private recreation lands in the area, and to the natural and visual aspects of the Escarpment. A joint study group may be needed, spearheaded by Hydro with representation from the Ministries of Natural Resources, Environment, and Transportation and Communications as well as from the local conservation authority and local government.

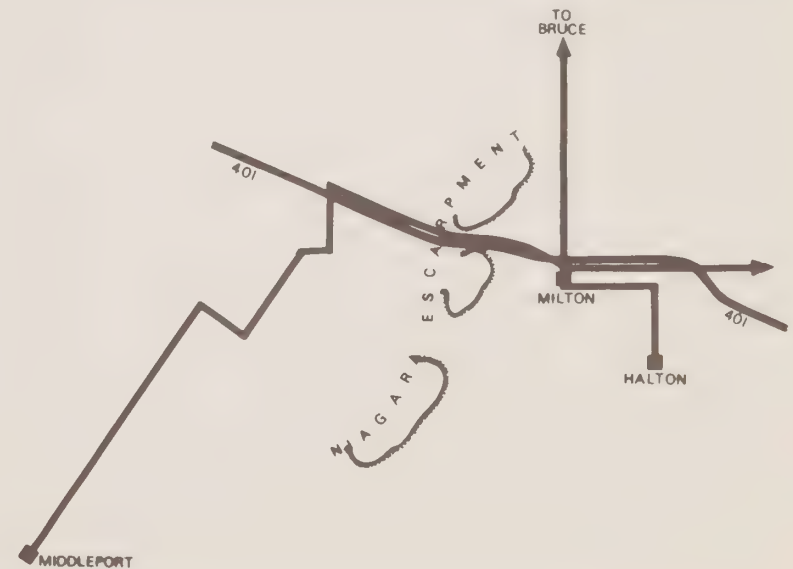
## *Second Option (System Q)*

The second option would also have two crossings of the Escarpment, one along Highway 401 and the other in the vicinity of Georgetown.

In this option, the Middleport line would continue north and across Highway 401, then turn east and run offset and parallel using existing trees for concealment, then cross the Escarpment in the same place and manner sug-

gested under Option 1. In this case however, only one double circuit tower would be required, with one circuit strung in 1976 and the other in 1982. If this option is followed, it is recommended that where the line crosses the Escarpment, the same program be followed as in Option 1 for the Rattlesnake Point crossing. The 1976 line would be taken down and placed on or underground along with the 1982 line, as would the 1990 line.

In this area, in response to a number of requests, a re-study was made of the Beverly Swamp to ascertain whether another alignment through, or skirting the swamp would be feasible. Such an alignment was found. Many people felt the line should go through the swamp on the right-of-



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# Conclusions

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way already purchased by Hydro and thereby avoid other impacts. While this is a compelling argument, the impact on a scarce and sensitive natural resource must also be recognized.

If this option is selected, we recommend that Hydro, in conjunction with the Conservation Authorities Branch, Ministry of Natural Resources, undertake a biological survey of the area to determine the propriety of following the corridor through the swamp. If such a course of action appears feasible, it is assumed that minimum disturbance would be necessary both in installation of the facility and future maintenance practices. Lattice structures would likely be desirable in such circumstances. If this routing is not desirable on environmental grounds, we recommend either the alternate set forth in this study, or that an alternate west of the swamp be followed.

Under Option 2, a connection would also be required from Halton north to the Bruce Station via Georgetown, consisting of three double circuit 500 kV lines and two double circuit 230 kV lines. Two of the 500 kV lines are required in 1979 with the third in 1980. The 230 kV lines are required much later, with the first slated for 1985 and the second for 1990 (essentially this is the same corridor that would cross the Escarpment along Highway 401 under the first option). North of 401, after proceeding through farmland, this corridor would then cross the Escarpment at a comparatively shallow location in the vicinity of Limehouse where extensive quarrying opera-

tions have already marred the landscape. The line would then continue north to the vicinity of Ballinafad. From here the best routing to the north will depend on location studies underway by Hydro to link to the Bruce generating station.

The Escarpment crossing at this point should be made in a similar fashion to that recommended at the Highway 401 crossing. Trees should be retained to the maximum between lines, with single element, compact, improved appearance structures used over the Escarpment. Tower tops visible against the skyline should be painted a light colour, with the lower part painted earth tones.

Because the 230 kV circuits are not required until 12 to 17 years from now, it is expected that the DAMUT system or conventional undergrounding will be feasible and that these facilities could be placed underground between the 500 kV structures on the Escarpment crossing area. In addition, because transformation from 500 kV to 230 kV in the Georgetown area will not likely be required until the mid 1980's, if at all, it is recommended that the site chosen for the substation be at or near a quarry site and that use be made of SF<sub>6</sub> switchgear and underground connections to the lines.

Because of high visibility along the total length of the Escarpment lands, and because of lessened impact on farm operations, improved appearance towers should be used from Halton to Ballinafad. Beyond that point lattice struc-

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# Conclusions

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tures could be used, depending on land use, residential density and visibility.

## *Third Option (System R—rejected)*

Although this option has been rejected, it is included to explain the attempt made to secure only one crossing of the Escarpment.



The least impact route to Halton would bring both corridors from Nanticoke and Bruce together for one crossing of the Niagara Escarpment along or near Highway 401, thence to the Milton-Halton area. However, this alternate has been rejected by Hydro as unacceptable. Hydro contends that if a disaster should occur on this joint corridor, all power from both stations would be lost. Hydro

prefers to have both lines separated by at least five miles to avoid destruction from tornados and other natural catastrophes.

For these reasons, desirable though it may be environmentally, placing both corridors in one right-of-way does not appear to be feasible on cost and reliability grounds, and a choice must be made from the other two alternatives. Of those, Option 1 is preferred for reasons of shorter line length, no visual impact on one crossing of the Escarpment (a temporary impact would occur between 1976 and 1982), more joint use of existing rights-of-way and reduced or no impact in areas parallel to the Escarpment to the north and south.

## **Milton to Halton Station**

At a point to the east of Milton both the Bruce and the Nanticoke lines come together. Hydro has proposed that a transformer station be constructed where these lines join. Two corridors would emanate from this point to the east, one to the Halton substation and the other easterly toward Woodbridge. Hydro proposes, and we concur, that this substation be located in the vicinity of the CPR tracks in the Parkway Belt. Although it would be desirable environmentally to have both lines from this point in one corridor, this would violate Hydro's security requirements. Hydro has suggested, therefore that one alternative concept from Milton east could have one corridor sited along the railroad, thence south in the Oakville-Mississauga mini-belt to Halton, with another cor-



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## Conclusions

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ridor about one mile distant, located on the south side and parallel to 401, following the highway to a point just south of Whaley Corners where the line would cross and continue to the east alongside proposed highway 407. Both corridors would be located in the Parkway Belt.

Hydro suggests that the corridor parallel to Highway 401 contain two double circuit 500 kV lines, one required in 1976 and the other in 1977. They also note the need for one double circuit 230 kV line in 1980, with another slated for an "indefinite" point in the future. The other corridor would proceed along the south side of the CPR track before turning south and will require two 500 kV double circuit lines, both in 1977. Two double circuit 230 kV lines are also required, one in 1985 and the other "indefinite".

For the corridor alongside Highway 401, double circuit, single element "improved appearance" towers are recommended. To reduce visual impact, the accompanying 230 kV line scheduled for 1980 should be located either in a DAMUT pipe between the two towers or alongside the highway, as should the future 230 kV line listed as "indefinite". This procedure would substantially reduce the right-of-way required. Trees should also be planted alongside Highway 401, between the road and the transmission towers so as to reduce visual impact. Detailed consideration of the location of towers and remedial measures to be undertaken should be explored jointly by Ontario Hydro, the Ministry of Transportation and Communications, and the Parkway Belt Planners.

Improved appearance towers are also recommended for the corridor alongside the CPR railroad for two reasons: first, this type of tower will create less difficulty for farm operations, and second, this area is slated for eventual urban growth as the Oakville North community in accordance with the Toronto-Centred Region concept. No 230 kV lines will be required in this location before 1985. They should be placed underground using the DAMUT system or equivalent.



Hydro has indicated that the substation east of Milton would be about 2,400 feet by 2,900 feet, including provision for SF<sub>6</sub> switchgear in 1980 and landscape screening. The Halton Station, located southwest of Streetsville, would be 1,900 feet by 2,400 feet in size. Both sites are



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# Conclusions

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located within the Parkway Belt. It is recommended that Hydro endeavour to use SF6 transmission cable from the substations out to the transmission lines in order to reduce visual impact, and that every effort be made to develop SF6 switchgear for the stations themselves prior to 1980 in order to reduce station size.

Both station sites are comparatively flat and low profile equipment is preferred. Planting and screening plans should be developed and implementation begun as soon as switchgear requirements are set. Land required for screening should be acquired at the outset with trees planted well in advance of equipment installation. Hydro should consult with local authorities to determine if local recreational facilities are desired at the site and if so, screening plans should be adapted accordingly. The costs of these facilities should, to a reasonable extent, be borne by Hydro providing the local community also agrees to maintain them.

## **Halton-Woodbridge-Parkway-Cherrywood**

This segment of the Preferred Route follows the Parkway Belt to its eastern extremity.

### *Halton Station to Woodbridge Station*

From the Milton area, the corridor proceeds along the south side of Highway 401, crossing to follow future Highway 407 to Woodbridge. As noted on the detailed maps, this alignment will require care where it crosses the Credit River and the Meadowvale Conservation Area,

the Toronto Airport and the Claireville Conservation Area. The Parkway Belt in this section is 700 feet wide, with 300 feet allowed for future utilities.

Only two double circuit 500 kV towers are required for this segment of the corridor, one in 1976 and the other in 1977. A double circuit 230 kV line is required in 1980, with another listed as "indefinite". The 230 kV lines would result in two additional towers on the right-of-way and impose a substantial additional visual impact on people travelling future Highway 407. Perhaps equally important in this area is the keen demand for land, resulting in extremely high land costs. This factor, coupled with the desire of the farming community to restrict intrusions on farmland to a minimum, suggests that both future 230 kV lines be placed underground as recommended for the Escarpment crossing. Although costly, undergrounding at 230 kV is feasible today, and with several years lead time, the DAMUT system should also be feasible -- and much less costly than conventional underground cable. Although undergrounding is expensive, there are balancing savings to be taken into account. The right-of-way, located as it is on high valued land, will be narrower and therefore less costly. Also, because of undergrounding, electrical reliability may increase as some portions of Hydro's lines will be overhead and others underground. Additionally, underground lines can be placed between 500 kV towers thereby further reducing the impact.

Even by following these recommendations, however, an

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# Conclusions

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expansion of 125 feet or more will be required alongside the present utility allowance in the Parkway Belt to accommodate the Hydro lines required. The Government has already slated 300 feet of right-of-way for utilities in the Parkway and by expanding this allowance Hydro's needs can be served without resort to acquisition of an entirely new right-of-way somewhere else.

In the area where the corridor passes north of the Toronto airport, tower heights cannot extend over 720 feet above sea level. Ground elevations range between 580 and 600 feet above sea level in this vicinity, thereby restricting tower heights to 120 to 140 feet. Hydro has indicated that it can build improved appearance double circuit 500 kV towers 140 feet high (which is 22 feet below conventional structure height). This height could fall within airport height requirements, depending on line placement, and no additional right-of-way would be needed. It is recommended however, that Hydro discuss this matter with Airport authorities and if deemed appropriate, the two double circuit 500 kV towers be replaced by three single circuit towers in the Airport area. The Parkway Belt in this location is mapped as being 4,600 feet wide (close to a mile in width) with a 300 foot allowance for utilities.

The proposed 230 kV lines, if built overhead, would fall within Airport height restrictions and no special arrangements should be needed.

The Woodbridge Station which is located in the Parkway Belt, would be 2,400 feet by 1,900 feet in size according to Hydro. Lines from the north would interconnect with the Middleport-Pickering corridor at this point.

Because of the comparatively flat, open character of the terrain, it is recommended that a low profile station be constructed utilizing SF<sub>6</sub> switchgear as much as possible. Screen planting should commence as soon as the site is acquired, using well developed vegetation so as to ensure rapid concealment. The use of SF<sub>6</sub> cable from the station out to transmission lines is preferred, if equipment is available.

## *Woodbridge Station to Parkway Station*

This link follows the Parkway Belt in its entirety. Care will be required in siting the corridor where it crosses the Humber River, north of Black Creek Pioneer Village, at the crossing of Yonge Street at Highway 7, and east of Bayview before linking into Parkway Station.

Between Woodbridge and Parkway stations, Hydro requires one double circuit 500 kV line in 1978 and an additional 500 kV circuit in 1983. In addition, two double circuit 230 kV lines are required, one in 1985 and another at an "indefinite" date. The total right-of-way width required is stated by Hydro to be 545 feet. The timing of the 230 kV lines would appear to allow for development of the DAMUT or other underground system however, as described for previous links. Therefore, the right-of-way

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# Conclusions

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actually required could be reduced to 425 feet for two double circuit 500 kV lines.

The Parkway Belt varies in width in this area from a minimum of 800 to a maximum of 8000 feet. From Milton to Thornhill the Belt is wide, with proposed Highway 407 separated from the utility corridor by a distance of up to one-half mile. Between Keele Street and Bayview Avenue the Belt narrows to 800 feet then widens again toward Markham.

To accommodate Hydro's line it would appear to be necessary to widen the Parkway by 125 feet or more between Keele and Bayview. It would also be necessary to implement scattered vegetative screening in this same area to reduce the visual conflict between road, residential developments and Hydro lines.

The Parkway Station would be located in the Parkway Belt and be the smallest of those required on the Middleport-Pickering corridor. The in-service date for this facility is listed as 1983, permitting the use of advanced SF6 switchgear.

The station should be low profile and well screened in keeping with similar recommendations made for other stations.

## *Parkway Station to Cherrywood Station*

This link follows the Parkway Belt as far as Highway 48

south of Markham, where the Parkway Belt presently ends. To the east, the detailed alignment for the Parkway has not been determined by the Parkway planners and an alignment for this corridor is therefore shown as following, for the most part, a railway and Hydro's Finch right-of-way into Cherrywood Station. Major environmental concerns along this link are a golf course east of Highway 48, and a crossing of the Rouge River Valley north of the new Metropolitan Toronto Zoo.

The electrical requirement for this link is three double circuit 500 kV lines, two in 1978 and one in 1983. Again, it is recommended that the 230 kV line be constructed through the use of the DAMUT system or other underground technology. The right-of-way width, therefore could be limited to 600 feet which could be reduced to a minimum of 490 feet in "extremely constrained conditions".

East of Highway 48, where the present Parkway Belt ends, it would be necessary to acquire a new 600 foot right-of-way from the Highway to the point where the alignment would parallel the existing Finch Hydro corridor.

The Finch corridor presently carries two double circuit 230 kV and one single circuit 230 kV line within a right-of-way width of 350 feet. It is suggested that consideration be given to rebuilding the lines within this right-of-way to accommodate the 500 kV lines with the 230 kV lines either underground or on compact towers.

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# Conclusions

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Another possible means for reducing the width of right-of-way in this section would be placement of the 1983 500 kV double circuit line on an existing 230 kV tower with the 230 kV circuits underground.

## *Woodbridge-Kleinburg and North*

This north-south link is intended to connect Hydro's 500 kV system through Barrie to Sudbury.

From Woodbridge, where a new station would be required, the new line would parallel an existing 230 kV line which passes through generally open land. Hydro has indicated that it requires three double circuit 500 kV lines on this segment, two in 1976 and one in 1982. A 230 kV line is also required with the in-service date stated as "indefinite". The width of right-of-way needed is indicated to be 650 feet. This width could be reduced by the use of compact towers. Compact towers are therefore recommended for the 500 kV line to be installed in 1982 and for the 230 kV line listed as "indefinite". Because of the open, flat character of the terrain, and because of the number of lines to be located in one right-of-way, it is recommended that improved appearance towers be used for all new towers on this segment of the line. Consideration should also be given to placing the 230 kV line underground at the time it is needed so as to further reduce visual clutter.

From Kleinburg north, two 500 kV single circuit lines already exist on the right-of-way that Hydro already owns.

One additional double circuit 500 kV line will be required on this segment in 1982, with another listed as "indefinite". One double circuit 230 kV line is listed, also with an "indefinite" in-service date. Hydro already owns sufficient right-of-way in this segment to accommodate the additional lines required. No significant impacts are encountered on the route.

Because the first additional line for this segment will not be required until 1982, it is recommended that compact lattice structures be used in order to provide conformity with existing lines. Similar structures should also be used for the future 500 kV and 230 kV lines when they are required. At that time, consideration should also be given to removing the existing single circuit 500 kV lines and replacing them with a single, double circuit structure of compact design.

## *Parkway North*

This corridor, which would connect to a new generating station on Georgian Bay, is scheduled to come into service somewhat later than either the Middleport-Pickering line or the other north-south corridors. Three lines are required in this corridor: two 500 kV; one in 1980 and another in 1985; and one 230 kV in 1980.

From Parkway Station, the line would parallel an existing line located to the east of Buttonville Airport. This location falls just at the end of the flight path and will require the use of compact towers to avoid any conflict with air-



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# Conclusions

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craft. In avoiding the flight path however, the line is forced to pass through a partially developed residential subdivision, requiring the removal of homes. Through this area, special study will be required to ensure that the line is located properly. It is suggested that compact, improved appearance structures be used for the 500 kV lines and that steps be taken to remove the existing line and have it placed on the 230 kV line when it is required. Screen plantings and other means for reducing visual impact should be followed in this area.

Proceeding north for about one-half mile, the line then jogs to the west to join and parallel future Highway 404 on the west side. Continuing past Victoria Square and

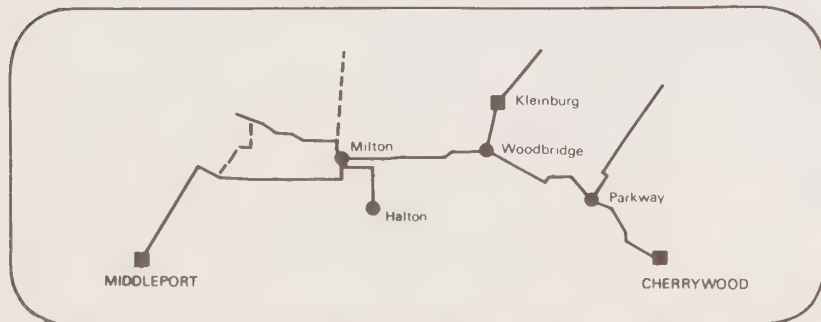
Gormley, the line would continue parallel to the proposed highway, by-passing a golf course and residential area west of Vandorf, then continue north, running about one and one-half miles east of Newmarket. The location of the line beyond this point will depend on studies Hydro has yet to make extending from this area to the north.

Because this line will parallel a highway for much of its length, improved appearance towers are recommended throughout. Special attention will be required to retain as much existing vegetation as possible for screening, and a landscape plan should be developed jointly with the Department of Transportation and Communications for that portion of the line that abuts the highway.



# Conclusions

## THE PREFERRED ROUTE

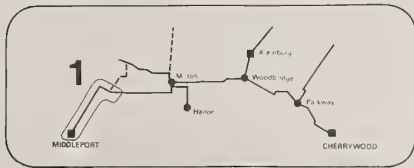
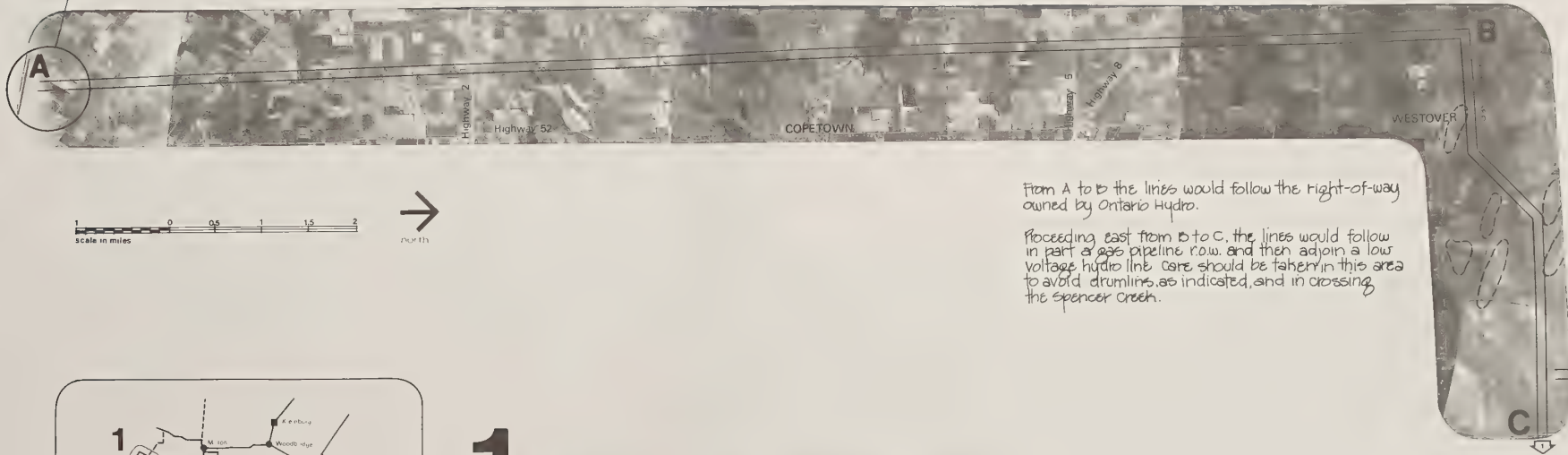


- 1** Middleport to Beverly Swamp
- 2** Beverly Swamp to Milton
- 3** Milton to Halton to Malton
- 4** Malton to Woodbridge to Yonge
- 5** Yonge to Parkway to Cherrywood
- 6** The 401 Corridor
- 7** Milton to Georgetown
- 8** Woodbridge to Penville
- 9** Parkway to Newmarket



existing middleport station requires  
landscape treatment for screening

NOTE: Alignments on this map are diagrammatic  
Precise alignments will be determined by Hydro  
following approval of the route.

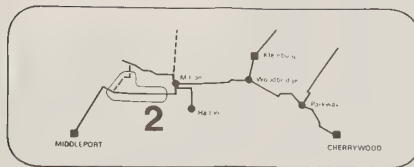


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Middleport to Beverly Swamp



# 2 Beverly Swamp to Milton



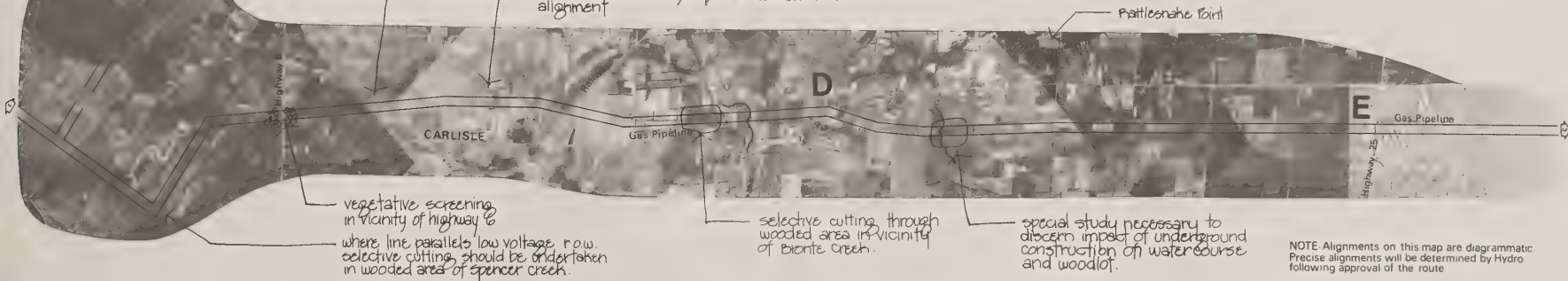
scale in miles  
0 0.5 1 1.5 2



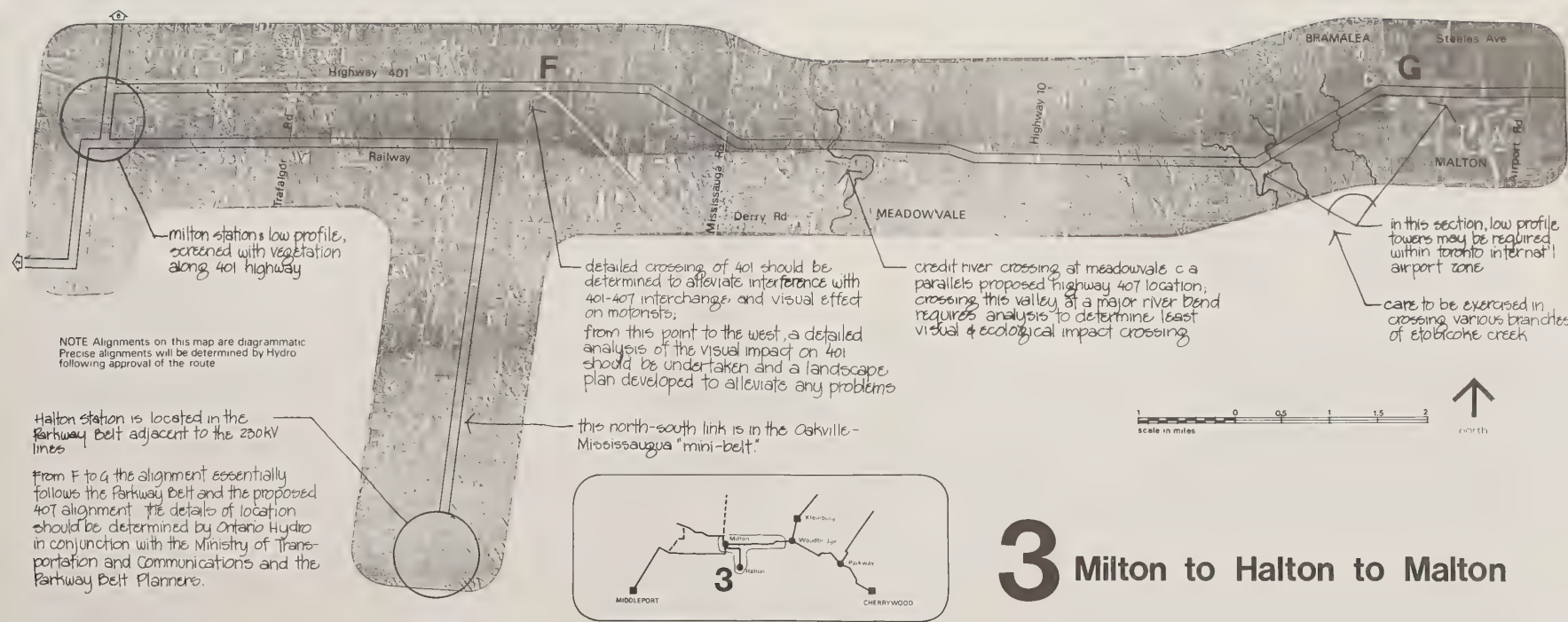
analysis of r.o.w. adjacent to park may  
to determine measures to alleviate  
visual impact

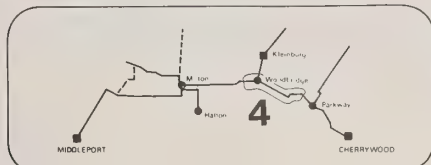
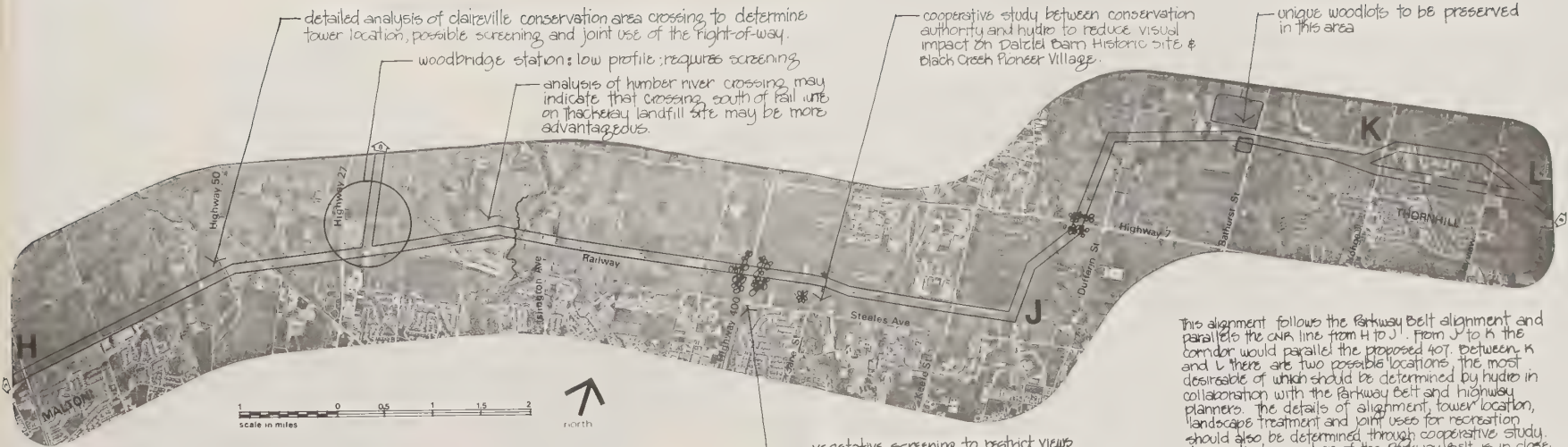
detailed consideration of r.o.w. in relation to  
new subdivision may require a deviation in  
alignment

this corridor, primarily follows a gas pipeline r.o.w. north of  
Carlisle & Hilbride. From D to E, through the Niagara Escarpment  
area, it is recommended that the line be put underground in  
the future. Detailed routing would follow either the north or south  
side depending on houses and other features to be avoided.



NOTE: Alignments on this map are diagrammatic.  
Precise alignments will be determined by Hydro  
following approval of the route



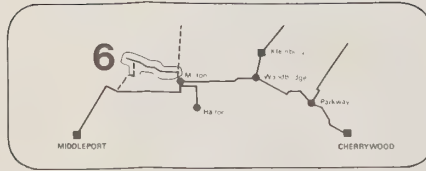


## 4 Malton to Woodbridge to Yonge

NOTE: Alignments on this map are diagrammatic  
Precise alignments will be determined by Hydro  
following approval of the route

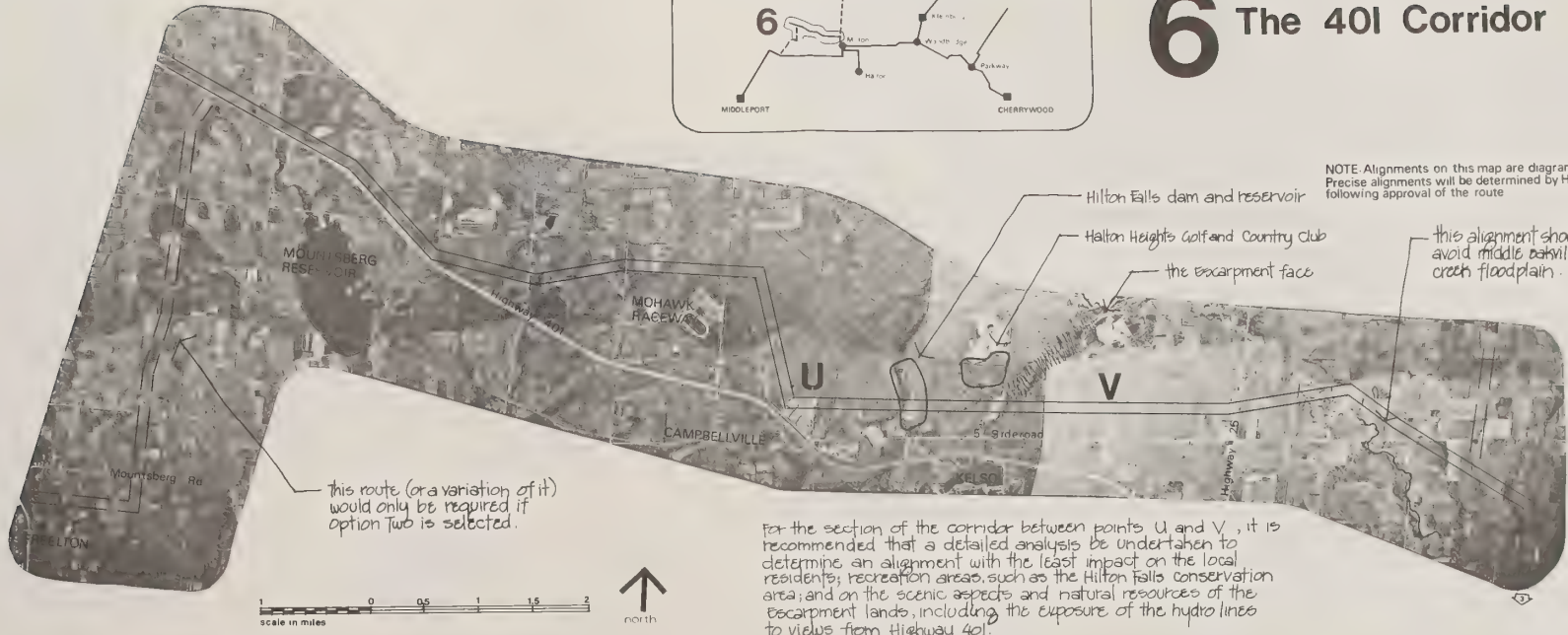






# 6 The 401 Corridor

NOTE: Alignments on this map are diagrammatic. Precise alignments will be determined by Hydro following approval of the route.

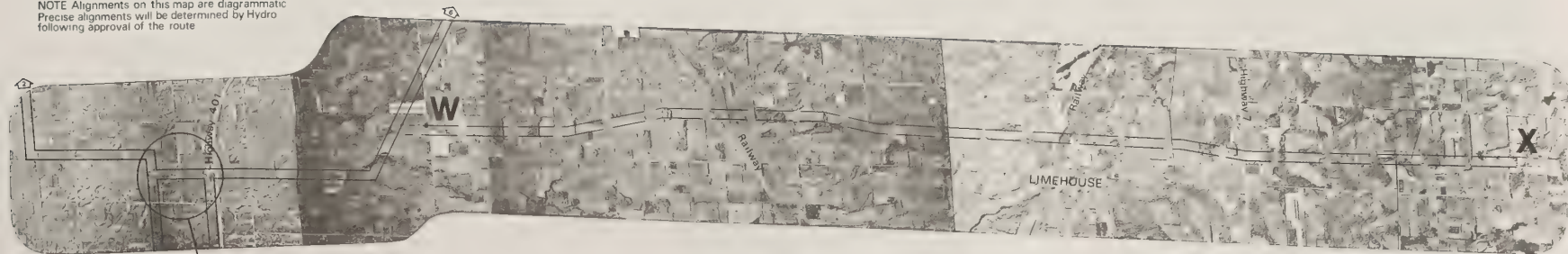


For the section of the corridor between points U and V, it is recommended that a detailed analysis be undertaken to determine an alignment with the least impact on the local residents; recreation areas, such as the Hilton Falls conservation area; and on the scenic aspects and natural resources of the escarpment lands, including the exposure of the hydro lines to views from Highway 401.

NOTE Alignments on this map are diagrammatic  
Precise alignments will be determined by Hydro  
following approval of the route

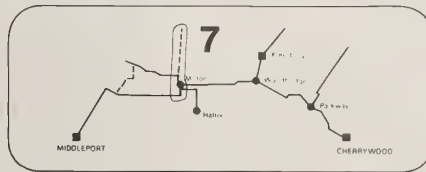
scale in miles

north



Milton station adjacent to Highway 401  
should be low profile and requires landscape  
screening.

Alignment between W and X would only be required  
to implement "option two."



# 7 Milton to Georgetown

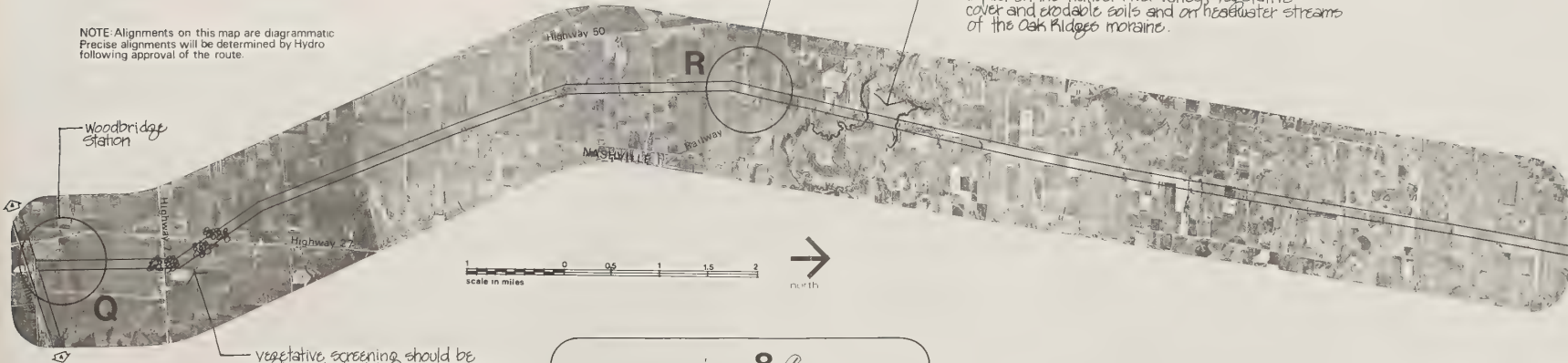
From Q to R the 500kV lines would parallel and existing 230kV r.o.w. North from Kleinburg station, the lines would parallel existing 500kV lines on a right-of-way Hydro already owns

NOTE: Alignments on this map are diagrammatic. Precise alignments will be determined by Hydro following approval of the route.

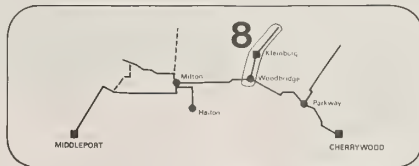
established Kleinburg station requires landscape treatment

In paralleling the existing 500kV lines, construction of new lines should be carried out with minimum impact on the Humber river valley, vegetative cover and erodible soils and on headwater streams of the Oak Ridges moraine.

Woodbridge station



vegetative screening should be implemented at highway crossings to restrict views along the r.o.w.



## 8 Woodbridge to Penville

The location of hydro lines on either the east or west side of 404 should be determined by visual factors, the preservation of natural features, and the effect on property owners already faced with expropriations for 404

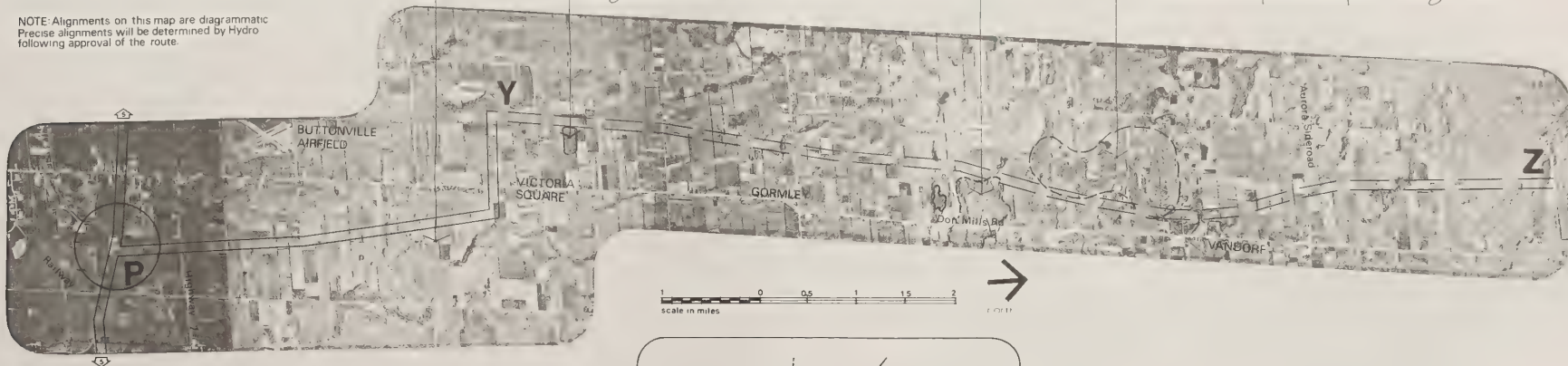
NOTE: Alignments on this map are diagrammatic. Precise alignments will be determined by Hydro following approval of the route.

a detailed analysis of this area should be undertaken to determine the least impact route through this residential area

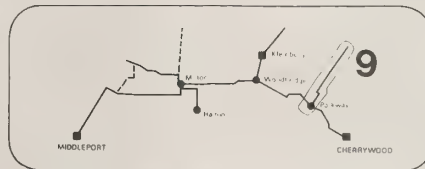
this woodlot is an important wildlife habitat which the final alignment should avoid.

the alignment should be detailed to have the least impact on this wooded, high elevation north of Simpson Lake

detailed alignment relative to highway 404 should consider the wooded, moraine character of this area and the potential impact on the golf course.



From the Parkway station P, the corridor would parallel the existing hydro r.w. as far as Victoria Square. From Y to Z the 500KV lines would follow the proposed highway 404 route. The detailed alignment, placement of towers and landscape treatment should be determined co-operatively by Ontario Hydro and highway planners



## 9 Parkway to Newmarket



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# Conclusions

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## Action Needed

Assuming acceptance, how can Hydro proceed expeditiously to acquire the right-of-way they need?

First, the Provincial Government must clear the way for prompt and early acquisition by Hydro of right-of-way within the Parkway Belt.

Next, to aid in resolving detail problems, Hydro and the Parkway planners should immediately meet to discuss how

best to adjust or widen the utility portion of the Parkway Belt to fit Hydro's needs and to go over the planner's studies for extending the Parkway easterly from Markham.

Third, both Hydro and the Parkway planners should meet with members of the Ministry of Transportation and Communications, and with affected local governments to discuss the location of the line, placement of towers, visual screening, and possible joint use of right-of-way.



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# Conclusions

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## Future Technology

Recommendations for the preferred route outlined in this report in several cases relate to future technology. With the proposed lines to be constructed between 1976 and 1990 it would be a lack of foresight to consider only present-day methods. Imminent technological advances may allow a tremendous reduction in environmental impact.

None of the recommendations are simply concepts or ideas. All can be expected to be available within the time span of this project, based on the present state of research. Also, the suggestions reflect technological advances currently being made within Ontario Hydro. In short, these recommendations are as realistic as possible based on the information available.

Most recommendations are concerned with either removing overhead lines and putting them underground, or, if that is not possible or appropriate, reducing their height and the width or right-of-way they require. Other recommendations are directed to substantially reducing the size of substations.

Of course, 500 kV lines can be put underground today -- at very high cost and questionable reliability -- but the technology is there; 230 kV lines can also be put underground today, and while the problems are not as significant as for 500 kV, the costs are also high. The recommendations in this report are for actions which should be less costly, are possibly more reliable, and are also

staged to provide more time for development and testing.

There can be compensating savings in undergrounding and compaction, in reduced cost for land acquisition and in diminished impact on the public. Some advantages, including the reduction or removal of visual impact, can not be quantified in dollar terms, but there are real advantages in increased public acceptability and reduced delay in project approval. And many people appear willing to accept the additional costs that may be involved.

Specifically the technological improvements recommended include:

- use of "improved appearance" towers at more locations than presently called for under Hydro's guidelines (technology available now)
- use of compact towers of reduced height and narrower right-of-way (technology developed by Hydro and in use for 230 kV lines)
- use of SF<sub>6</sub> switchgear for substantially reducing the size of substations and for providing underground connections between substations and transmission lines (technology being developed in other countries and also by Hydro)
- underground cable (presently available at 500 kV but very costly. Reliability for long distances questioned by Hydro)
- use of DAMUT system for placing lines in a large pipe underground (Hydro developing technology now for 230 kV lines)

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# Conclusions

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- underground cable for 230 kV (presently available but costly)

Implicit in these recommendations is the need for expansion and acceleration of research and development by Hydro, either alone or in conjunction with other utilities or manufacturers with respect to: 500 kV transmission using the DAMUT system; compact towers at 500 kV; SF<sub>6</sub> switchgear and substation underground cable; conventional underground cable; and other techniques that promise to reduce or eliminate the need for overhead transmission.

A review of construction timing outlined in Hydro's systems studies indicates that the earliest date that any 230 kV line is specifically required within a 500 kV corridor is in 1980. This should provide adequate time to perfect 230 kV underground procedures for those installations recommended in this report. For one crossing of the Escarpment, 500 kV undergrounding is recommended in 1982. It is assumed that this will provide sufficient time for development of the lower cost DAMUT system for this voltage, otherwise conventional undergrounding will be required.

## Tower Design

In some cases there could be as many as five towers located in one right-of-way. The visual impact could be substantial and for that reason alone, the design of the towers is very important.

There are perhaps two ways to consider the visual impact of transmission towers. One is to design and locate them so that they are as unobtrusive as possible -- to conceal them or blend them as much as possible with the landscape through which they pass.

Where this is not feasible, a second approach that can be considered is to recognize that the towers will be seen by many people and should therefore be as pleasing to the eye as possible. This approach underlies the desire for "improved appearance" towers, which many consider more appealing than the conventional lattice structures.

In their guidelines, Hydro has recognized the need for improved appearance towers at certain locations. Applying their criteria to this study region, they indicated that 50% of the structures would be of "improved appearance" design on the Parkway alignment. Following their criteria, Hydro will install improved appearance towers in "established or definitely planned urban or suburban communities, ... (on) lines running parallel to main heavily travelled highways or parkways, ... at main highway crossings, ... through areas of special historical or scenic value, such as across the Niagara Escarpment, ... where existing lines or existing rights-of-way in areas as outlined (above) are to be completely rebuilt, ... (and) adjacent to new low profile type transformer stations". Hydro's criteria also states that "Improved appearance structures would not normally be used for new lines built through rural areas."



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## Conclusions

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Within this study region, the application of Hydro's criteria becomes overly restrictive in determining an appropriate level of improved appearance towers. While we agree with Hydro's criteria as a beginning in determining where improved appearance towers should be used, there are other factors that require consideration.

Although there are large parts of the study area that can be thought of as "rural", the vast and overpowering influence of Metropolitan Toronto and other major communities has turned most of the region into a mixture of urban, suburban and exurban dwellers scattered throughout the countryside. While there are still large farming areas in the study region, it is probably not correct to call these areas "rural". There is too much permanent urban influence for that.

In the farming areas of this region, where several towers are to be located on one right-of-way, there would be an added advantage in the use of single pole improved appearance towers because they take up less ground area than lattice structures and make it somewhat easier for farm equipment to function. And in all cases, towers should be placed abreast not only to make farming operations easier, but also to reduce the visual impact. In sensitive areas, biological areas, although corridors should be aligned to avoid such areas, the construction of lattice towers would create less damage than the installation of "improved appearance" towers and therefore, may be more advantageous if lines must pass through.

Hydro's criteria could perhaps be expanded to call for "improved appearance" when several towers -- rather than one alone -- are to be located in one corridor. The visual impact could be less when several improved appearance structures are located together in contrast with a number of lattice structures located together.

The use of improved appearance towers should also be related to visibility. Outside of low density areas, where large numbers of people will be exposed to the view of towers consideration should be given to the use of improved appearance structures. Along major highways in particular where towers could be easily seen, Hydro's criteria could be expanded to include lines that are back from the highway as well as those immediately alongside.

For this study area, recommendations for improved appearance towers have been made at various locations along the recommended right-of-way. These recommendations represent judgemental decisions as definitive criteria for the use of improved appearance structures requires further study as we have noted. The type of improved appearance structures used should follow the suggestions of the Citizens Committee on Tower Design, which are discussed in detail later in this report. Other suggestions by the Committee are also pertinent and in some cases are related to the recommendations noted on the detailed route maps found at the end of this section.



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# Conclusions

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## Multiple Use of Rights-of-way

Multiple use of Hydro's right-of-way corridors is an excellent concept. Clearly, when land is both expensive and in short supply, every effort must be made to arrange for other uses along the right-of-way which are compatible with the primary objective -- the transmission of electric power. Many excellent suggestions were found during analysis of the questionnaires; others were also offered during the course of the open planning meetings. The most promising concepts are described in the following paragraphs. Some are recommended for certain parts of the preferred route.

In finding a corridor for any new transmission line, a fundamental principle should be to investigate existing rights-of-way to see if they might accommodate the proposed line. Pipelines, railroads, water and sewer lines, telephone lines and existing Hydro rights-of-way all present useful opportunities for locating a new transmission facility alongside. All such facilities, both existing and proposed, were inventoried and analyzed before selecting the route finally recommended in this report. In fact, existing or proposed rights-of-way including Hydro lines, highways, railroads and pipelines were followed for a major portion of the preferred route.

At times, there may be some disadvantages to this practice, however, joint use is a basic planning principle, clearly recognized in the Parkway Belt concept for the Toronto-Centred Region.

Problems which may arise out of joint use, particularly between a highway and a transmission line, for example, can very often be solved through detailed siting and design. By using the existing features of the natural environment such as landforms and wooded areas, together with landscape planning of the right-of-way, the visual problem of joint highway-Hydro rights-of-way can be largely overcome. This approach must be considered in the early planning stages however, and not at the time of construction. In the case of the Parkway Belt, the opportunity exists to consider the detailed interaction the highway and transmission line will have on one another and to alleviate any problems through detailed site location studies at the outset.

In addition to the benefits of joint linear land uses in a common right-of-way, there are other complementary uses that can be accommodated without interfering with the primary purpose of the corridor. In a recent announcement, Ontario Hydro has stated that they desire "to encourage more uses of power line rights-of-way for a number of purposes" and "consider their function as public parks and recreational facilities as particularly desirable". A Hydro right-of-way in an urban or suburban area presents opportunities for uses such as trails for walking, cycling, or horseback riding, playfields and court games. An important point to note is that the right-of-way in a built-up area can fulfill the need for open space. In a more rural setting, there may be better places for recreation than a Hydro right-of-way.

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## Conclusions

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One problem with complementary joint use activities is the impact they might have on adjacent land owners. This is particularly true in rural areas where use of the right-of-way may be an intrusion on the privacy of property owners or destructive to farming operations. It is important, therefore, that the decision on potential uses for the corridor be made in conjunction with those directly affected.

Where active interest is shown and a plan prepared and adopted, Hydro should assist in its implementation to the maximum extent possible, without actively engaging directly in the project itself -- a function which properly falls under the jurisdiction of the local community.



**Part**  
**b**





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# Inventory Collection

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## Present Land Use

Base data used for this inventory was obtained from the Canada Land Inventory Maps showing present land use. Land use maps were also obtained from the Toronto-Centred Region Planning group, whose maps date from 1969. Because these sources are inconsistent and not completely up-to-date, they were not used directly. Instead, a group of aerial photo interpreters was set up within the Forestry section of Ontario Hydro and instructed by B.H.I. Limited in techniques for updating the Canada Land Inventory maps to show present land use. During October and November 1972, Ontario Hydro had acquired photo coverage at a scale of 1"=2000 feet for much of the study area and these photos were used to update the land use inventory maps. The remainder of the study area had been included in a semi-annual photo coverage of Metropolitan Toronto in the spring of 1972 and in the Forest Resource Inventory coverage. Transparencies of the Canada Land Inventory maps at the 1:50,000 scale were used as work sheets for indicating changes and additions stemming from the aerial photo interpretations and this information was transferred to a final coloured map by B.H.I. Limited staff.

## Cultural, Recreation and Open Space

This map shows a variety of recreational sites owned by the various levels of government as well as by private concerns. No composite mapping of such information was found to exist for the total study area and therefore

had to be compiled from original sources. Initially, contact was made with the Land Use Co-ordination Section, Ministry of Natural Resources who did not, however, have the necessary information available. Contact was then made with the individual agencies controlling specific types of recreation and open space facilities: the Environmental Planning Branch, Conservation Authorities Branch, and the local Conservation Authorities within the region.

Information on trails was acquired from the responsible organizations: The Bruce Trail Association, The Ontario Trail Riders Association and The Guelph Radial Trail Club.

Other outdoor recreation sites, which are primarily privately owned, as well as golf courses and cemeteries, were interpreted from aerial photographs.

Information on historic sites was ardently sought during the inventory stage, but with little success. One source, The Canadian Inventory of Historic Buildings, compiled by the Department of Indian Affairs and Northern Development, Ottawa, consists of a computer printout providing general location, date, style, and architectural details of sites. Regretably, all of the sites recorded are located only within cities, towns or villages.

The Public Archives, Province of Ontario, has an incomplete inventory of historic sites in its possession. Their

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# Inventory Collection

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collection was compiled under the direction of the late Professor Goulding of the University of Toronto School of Architecture. Although numerous rural sites were included in this inventory, their exact location could not be mapped from the information given. With this information, sites could be only generally located on a map. Field inspection would be necessary to accurately pinpoint the site. Such a process was found to be beyond the time and manpower limitations of this investigation, considering the hundreds of sites involved.

## Transportation Land Use

The basic information for this map was secured from Ontario Hydro who also provided detailed information on each Hydro right-of-way showing widths, number of lines, space available for expansion and proposed facilities. In addition, the most recently available data on proposed highways was acquired from the Ministry of Transportation and Communications. Some of the expressway proposals shown are from 1965 data but have been released only recently.

Airport influence zones are also shown on this map. These zones designate areas adjacent to runways which must be kept free of towers and lines. Around the proposed new Toronto Airport at Pickering an extensive area was found within which tower lines over 120 kV and substations above 120 kV can not be built. Information on airports was acquired from the Toronto Area Airports Project, Canada Ministry of Transport and the Flying Farmers

Association.

## Proposed Land Use

In addition to existing natural features and land uses, it is important to consider the future land uses proposed for the study area. The plans of municipal, regional, provincial and federal governmental bodies that affect the study area are illustrated in Map 4.

## *Municipal Official Plans*

Through direct visits to municipal offices during January and early February, copies of Official Plans and plan Amendments were obtained from the majority of municipalities in the study area. To ensure accuracy and completeness, plans and amendments were checked against records and documents of the Official Plans Section, Plans Administration Branch, Ministry of Treasury, Economics and Intergovernmental Affairs. Any plans or amendments not already received from municipalities were obtained directly from the Plans Administration Branch.

Any new Official Plans or Amendments received from municipalities or the Plans Administration Branch up to the beginning of June were incorporated into the study. A new draft Official Plan for The Town of Whitby was received on June 26th 1973, and while too late for inclusion in the mapped compilation, its policies and land use categories were reviewed and incorporated into the study process in selecting a preferred alignment.

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# Inventory Collection

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Map 4 presents a compilation of Official Plans and Amendments for the municipalities within the study area. These plans are also shown in three stages of approval: draft -- plans under review by the Planning Board and Council of the municipality; proposed -- plans having official municipal approval; approved -- plans having official ministerial approval. While an Official Plan is not properly considered an official policy statement until it has received both municipal approval and the signature of the responsible Provincial Minister, it was considered important to present all information on the future land uses proposed for the entire study area. All available plans were reviewed and mapped regardless of official status, with the stage of approval indicated for each plan. Throughout the entire study area, only one municipality, Scott Township, did not have an Official Plan completed at least at the "draft" stage.

Creation of a set of common legend categories was necessary before a uniform compilation of the many plans could begin on a regional scale. To obtain a common legend classification, the proposed land use policies set forth in Section IV of each plan were reviewed to determine the level of consistency between plans. The often detailed policies found in each plan were broken into seven basic categories of land use for compilation: (1) urban area and residential; (2) commercial; (3) institutional; (4) industrial; (5) extractive industrial; (6) open space and restricted area; (7) agricultural or rural. Using these categories the pattern of land uses proposed for each municipality was

mapped from "Schedule A" (a map of the proposed land use areas) found in each Official Plan or Amendment.

All types of residential land use -- estate, cottage of various densities, as well as densely built-up towns and cities -- were included in the first category. Similarly, all the various types of commercial, institutional (churches and public facilities), industrial and extractive industrial uses designated by the Official Plans were included in the appropriate general categories of Map 4.

Some Official Plans include land use policies restricting development in areas designated as "hazard lands", including stream valleys, areas of erosive soils, steep slopes and other similar features. In addition, some municipalities, including the Town of Burlington, Esquesing Township and Chinguacousy Township, have adopted specific plans and policies restricting the uses of lands on the Niagara Escarpment, with an emphasis on long term conservation, open space and recreation for this portion of their jurisdictions. Such plan policies and categories were included in the "Open Space and Restricted Area" category shown on Map 4, together with the private, public and open space uses designated on other plans.

With exception of some completely urban towns and cities, all municipal Official Plans include "agricultural" or "rural area" land use policies. However, in areas desig-



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# Inventory Collection

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nated "agricultural" and "rural", the restrictions placed on industrial, commercial, and residential development vary dramatically from plan to plan. In instances where the primary proposed land uses of such policies are agricultural, these designations were included under the "Agricultural or Rural" category of Map 4. Under the general agricultural policy area, Caledon and Albion Townships have adopted policies restricting certain portions of their agricultural policy area to agriculture and associated uses only. In contrast, a "Buffer Agricultural Zone" permitting specific "urban fringe" uses has been separately designated within the agricultural policies of Chinguacousy Township. In Map 4 the boundaries of these specific agricultural policy areas have been indicated by black lines within the "Agricultural or Rural" areas of the appropriate municipalities.

## *Regional Plans*

Several regional parks sites have been identified by the Central Ontario Joint Planning Board in the eastern portion of the study area. While these represent tentative designations, they nonetheless express the significance of the sites, and an intent for public preservation.

Also included in Map 4 are the locations of the proposed Metropolitan Toronto landfill sites in the Township of Pickering. These locations were obtained from the Waste Management Branch, Ontario Ministry of the Environment.

An airport presents a clear conflict with any electric transmission line. Not only is there danger of low flying aircraft hitting towers located within or close to airport flight paths, but electrical interference could conceivably occur with aircraft communication or navigational equipment.

The Pickering Airport represents a new and significant site which is still unsure. However, as a major federal proposal, its inclusion is necessary in any complete consideration of the study area. Mapped information on the area proposed for the Pickering Airport was obtained from the Toronto Area Airports Study, Ministry of Transport, Government of Canada.

The proposed new town of Cedarwood is located immediately to the south of Pickering Airport and it, too, is in the very early stages of planning. A special provincial study group, The North Pickering Community Project, Ministry of Treasury, Economics, and Intergovernmental Affairs, is preparing the comprehensive land use and development plans for this project. Possible areas of industrial development have been tentatively considered on the border between Cedarwood and the Pickering Airport, and an open space band on the western and southern boundaries of the town has been considered. Here again, the Parkway Belt is of significance since it would run adjacent to the southern boundary. As yet only conceptual planning proposals have been released on these aspects of the new community.



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# Inventory Collection

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## *The parkway belt*

On June 4th, 1973, the Provincial Government released a public report on "The Parkway Belt West". As presented in the report, the Parkway Belt is envisaged as a network of open space areas and service corridors. It begins at Dundas and ends at Oshawa. The published report deals only with The Parkway Belt System West -- that section running from Dundas to Markham -- the rest (from Markham east) is presently being designed by the provincial government.

As stated in this public report, the Parkway Belt Proposal is intended "to prevent the ills of urban sprawl in Central Ontario by creating a network of open spaces and corridors, to separate and define communities, to link communities with service corridors, to provide a space for urban residents".

Prior to the release of this Report, only a very general location for the Parkway Belt could be mapped from a small map included in the May 1970 report: "Design For Development: The Toronto-Centred Region Plan". A copy of this general location map at a suitable scale was requested in the early stages of the study. However, this was not received as the agency responsible stated that a copy was not available, and that the plan was being re-studied at that time.

Following the June 4 Report, a request was made for a copy of the 1:50,000 scale map of the Parkway Belt West

which was on public display. As this was refused, the pertinent information was traced from the public display map. Following this, the Parkway Belt Task Force asked to check our tracing of the public map. Finally, on July 11, a map of the Parkway Belt West detailing widths and proposed uses was provided. This information was then used to reevaluate the alternate routes, as displayed at the Series III meetings, in the area of the Parkway Belt.

## *The Niagara escarpment*

Also on June 4, the Provincial Government released a Report entitled "Government Policy for The Niagara Escarpment". This policy statement follows the "Report of the Niagara Escarpment Task Force" and introduces a new system of planning for the Niagara Escarpment Area.

A joint provincial-municipal body, the "Niagara Escarpment Commission", will be established to draft a master plan for the Escarpment planning area. A planning process leading to the statement of provincial policies in a master plan will be initiated. Municipal Official Plans will be mandatory. Both the provincial master plan and municipal official plans will be legally binding on provincial and local governments. All existing official plans will be modified to reflect the approved provincial master plan. Assistance will be given to municipalities in drafting and modifying their official plans. Before the adoption of the master plan, full provision will be made for public comment and response to plan proposals. The policies also state that the local governments will play

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# Inventory Collection

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an increasingly significant role in plan formulation and execution.

The Niagara Escarpment Planning Area which will be encompassed by this planning process is illustrated on Map 4.

## Natural Resources

This map was compiled from a variety of sources including aerial photo interpretation, the Canada Land Inventory, Arda-Land Capability Maps, Timber Management Branch, Ministry of Natural Resources and Conservation Authorities.

Forested areas which are indicated are separated into two types: (1) Wooded areas including vegetation from 20 feet to 60 feet in height and reforestation plantations; (2) mature forests over 60 feet in height. County and agreement forests are those managed in co-operation with private landowners, municipalities or Conservation Authorities. Many of these, particularly Conservation Authority Forests are often used for recreational and wildlife management purposes.

Agricultural capability is shown as Class 1 and Class 2 lands; areas unshaded are Class 3 or lower. Organic soils including such important agriculture as the Holland Marsh are also indicated.

## Critical Natural Features

Again, a variety of sources were used to compile this composite of data. Floodplains, steep slopes, water wetlands and marshes were interpreted from the "Hazard Land Mapping" available from the Strategic Planning Branch, Ministry of the Environment. As indicated on the map, this data was incomplete for the study area. Beyond the completed area, rivers, streams and lakes were derived from the base Army Survey Topographical Maps.

Sensitive Natural Sites consist of areas designated by the Toronto-Centred Region Planning Group. In 1969, through the Conservation Authorities Branch, a request was made to locate "Unique Biological Areas" in the Toronto-Centred Region. Information was received from district personnel of the Conservation Authorities, the Department of Lands and Forests, the International Biological Program, the Ontario Federation of Naturalists, other conservation and naturalist groups and interested individuals. This data was compiled into a book which indicates, for each site: (1) the data source; (2) approximate site; (3) floral and faunal characteristics.

## Scenic Quality

No existing inventories could be found delineating the scenic resources of the region as such. There is, however, the Canada Land Inventory of Recreation Capability which ranks landscape units having the ability to support recreational activities of various types. Within these

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# Inventory Collection

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delineated areas, there are subclasses defining the physiographic features which help determine more specifically their potential for land and water based recreation. These include areas of diverse landform, lakes, etc.

This inventory, along with Chapman & Putnam's "Physiography of Southern Ontario" and Toronto-Centred Region Study maps of recreational potential, were used as a basis for this map.

## Land Elevation

This map was interpreted directly from the Army Survey Topographical Maps which shows contours in 100 foot intervals from mean sea level.

## Local Data Collection

The process of acquiring the information shown on this map is documented in the section titled Public Participation, Page B19.





## Inventory Collection





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# Governmental Planning

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In Ontario, there are three levels of planning -- provincial, regional and municipal, which must be considered in order to obtain an overall view of environmental concerns and future land use proposals. Securing data from these groups is complicated, for their innumerable subdivisions often operate independently with only loose co-ordination, if any at all. The result is that almost every planning agency must be approached individually.

Concise, accurate and up-to-date information is vital if accurate conclusions are to be reached, particularly when locating a transmission facility within an environmentally sensitive region. To secure accurate data, this study began by asking Provincial agencies for inventories, maps, surveys and reports on both present and future plans within their jurisdiction.

Ideally, such information should be available from a central source, but the Toronto-Centred Region planning group, who, one would assume, should have such data, does not. It was necessary to approach each Provincial agency individually to secure such data as was available.

For the most part, each Provincial agency with a functional responsibility for some aspect of land use or land development makes its own plans -- which they must, to be sure. Our experience indicated, however, that inter-agency co-ordination was, at best, fragmentary. There appeared to be no central guide to those courses of action

pursued by individual agencies which would provide some central thread to the whole activity.

Our efforts to secure basic data revealed that our inventories, although they rely heavily on existing information from Provincial and other agencies, represent the first instance in which all of this data has been brought together in one place. Subsequently, we had numerous requests from both Provincial agencies and local governments for access to the maps as an aid in their own planning work, since no other centralized source existed.

From this experience it appears that the Ontario Government could consider establishing a central data source from which both environmental and planning information can be readily obtained. Even if plans are not co-ordinated, the data on which plans are based would be. To be useful, such a centralized source must be accurate and continuously updated. Old data is often the equivalent of no data. Such a service should more than pay for itself, for it avoids the need for each agency to gather its own data for studies -- the same data that others may also be gathering.

The service should also be available to the public. The uncertainty and financial waste which results when private developments proceed without access both to basic data and to government intentions as expressed by plans, cannot but frustrate the functioning of the private sector, on which the growth of the area depends.

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# Governmental Planning

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## *The Parkway Belt*

The letter of October 31, 1972 from the Solandt Commission to the Honorable A.B.R. Lawrence, Q.C., which outlines the terms of reference of this study stated that "In addition to the co-operation of Ontario Hydro, Mr. Howlett and his team would have to be assured of the co-operation of the Toronto-Centred Region Planners and the Niagara Escarpment Task Force. I do not think that either Mr. Howlett or the Solandt Commission can be successful unless this co-operation is assured." That co-operation was not received until near the end of the study.

On June 4, the Government simultaneously announced policies, plans and programs for both the Parkway Belt and the Niagara Escarpment. Delay in the announcement until that date resulted in the delaying of this study's third set of public meetings in order that we could incorporate the detailed information that was expected to be presented.

While more specific than previous government reports on the subject, the information presented on June 4 still did not provide sufficient detail to ascertain whether the Middleport-Pickering Hydro corridor could be incorporated into the Parkway Belt or not. Nor would the Ministry provide any more information than was publicly available unless we would make a commitment not to reveal any of it. We were unable to learn whether the Parkway planners had provided room within the Belt for the corri-

dor. Had we decided to look at the detailed data on a confidential basis, we would still be in the vulnerable position of making recommendations that could not be publically explained or defended.

Subsequently, on July 11th, a more detailed map was provided by the staff of the Parkway Belt Study Group, Ministry of Treasury, Economics and Intergovernmental Affairs. This map indicated that a 300 foot wide utility strip extended from end to end of the northern portion of the Parkway Belt. While this width occurs throughout, and is associated with the proposed Highway 407 location in most places, there are locations where the Parkway Belt is much wider than that required for the highway and utility corridor together.

Based on this information, it appears that the proposed Middleport-Pickering line could be partly accommodated within the Parkway Belt. The Belt would need to be widened at those places where only a 300 foot wide utility corridor is provided in order to accommodate the width of right-of-way that Hydro requires.

A corridor as large and significant as the Middleport-Pickering corridor, for which the need has been demonstrated for some time, could well have been actively considered and incorporated in the Parkway Belt during the several years that planning for the Parkway Belt was actively underway. A paragraph in the June 1973 Report on the Parkway states: "In the early stages of designing

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# Governmental Planning

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the Parkway Belt, consideration was given to running a part of the Nanticoke-Pickering 500 kV line throughout the length of the Belt. This was not considered feasible at the time." The reasons for rejection, however, are not stated.

## *The Niagara Escarpment*

Similarly we were unable to determine if the Niagara Escarpment Task Force had studied the impacts of transmission lines on the Niagara Escarpment, or investigated potential locations for any necessary crossings, now or in the future. The Report of the Task Force does not touch on these matters. The Ministry of Treasury, Economics, and Intergovernmental Affairs would not comment or respond when these issues were raised.

Our own studies of the Escarpment revealed locations which were felt to represent minimum impact crossings. While the 1968 Gertler Report on the Niagara Escarpment gave an excellent guide for the significance of various areas of the Escarpment, it is not known whether any further provincial studies were undertaken concerning transmission corridor impacts, or whether there are areas which should be precluded from consideration in attempting to find the necessary crossing.

## **Local planning**

As with all inventory maps prepared for this study, a great deal of time was involved in collecting the base data for the Proposed Land Use Map.

In many cases, municipalities with long established Official Plans and numerous Amendments did not have up-to-date plan consolidation maps. With those plan consolidations that did exist, as with most of the Official Plans themselves, map scales varied from amendment to amendment and plan to plan, lengthening the compilation time required. The status of each amendment and whether or not it had been superceded by another amendment also had to be individually checked during the compilation process.

Although any compilation of Official Plans must overcome differences in land use designations, an additional problem occurs when plan maps are prepared with a variety of scales. No standard set of map scales or map scale reductions has been established in Ontario, and as a result, Official Plan maps are produced in a profusion of scales which are not consistent with one another. The compilation becomes exceedingly difficult and time consuming as a consequence. Only the Hamilton-Wentworth Planning Board and York Regional Municipality had consistent scale mapping for areas under their jurisdiction.

The provincial standardization of mapping scales would be advantageous to all involved in the planning process, particularly when one considers growing numbers of inter-departmental provincial studies, and the continuing establishment of regional governments.

While the planning staff of the Official Plans Section were

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## Governmental Planning

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more than helpful in collecting the necessary data, it is unfortunate that their agency does not have the resources to maintain an up-to-date catalogue of Official Plans and Amendments. Such a catalogue would be extremely useful to a number of regional agencies and Provincial departments, as well as to Ontario Hydro, in their ongoing studies.



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# Public Participation

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## Introduction

From start to finish, we have tried to involve the public in every step of our study. In his Interim Report of October 31, 1972, Dr. Solandt underlined the need for the planning process to be as open as possible. At each stage of the study, public discussions have enabled interested citizens to contribute information, ideas and criticism, and to aid in the selection of the preferred route.

The broad objective of the participation program has been to involve all sectors of the community in the planning process, so as to ensure that the eventual route selected would be as responsive as possible to public concerns. To fulfill this aim, it was considered essential to secure ample publicity for the study so that people would be aware of opportunities to participate at all stages leading to route selection. It was also hoped that a basic methodology for studies of this nature could be established to aid in future program planning.

As the entire study area covers 3,340 square miles with a population of approximately four million, (including Metropolitan Toronto), it would have been quite impractical to attempt to reach every one of these residents within the time and budget constraints of the study. The plan therefore was to concentrate on those living outside of the lakeshore urban complex, who were more likely to be directly affected by the corridor. The existing means of communication were utilized as fully as possible, within the limitations of time and budget.

To assist in developing a suitable program, first Dr. Desmond Connor, and later Mr. Henry Fletcher were engaged as consultants with special knowledge in this field of public participation. The elements of this program are described in the following subsections.

Undoubtedly, the study has benefited from the input of interested citizens. Many individuals made an important contribution in simply providing basic information, as residents of an area often possess more detailed knowledge of their own locale than is available elsewhere. Citizens also contribute their own viewpoints which often include factors of which a planner may not be aware. Local social values, interests and priorities certainly help to shape a decision. The individuals' considered remarks are often a source of new and helpful ideas; the planner's attention to local public opinion can aid his surmounting the limitations which traditional thinking imposes on his work. Finally, the very fact that the public is involved leads to a greater understanding and perhaps, acceptance of the final routing decision; involved people are aware of the processes of decision-making and are not simply informed of a decision by a governing body.

All of these types of contributions have been made to the study. Interested citizens have served on special subcommittees on tower and substation design; others have spent considerable time and energy writing perceptive and detailed letters on many subjects.

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# Public Participation

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During the study, twenty-eight public meetings were held at Queens Park and in communities throughout the region. A list of meetings giving dates, places, and approximate attendance is contained in Appendix III.

## Queens Park meetings

Meetings at Queens Park were held on ten occasions throughout the course of the study and were consistently attended by a number of regular participants who had been involved in the previous hearings of the Solandt Commission. They included representatives of provincial and municipal governments, citizens' and conservation groups, as well as some individuals who were directly concerned with the siting of the line. For the most part, these participants were well informed about the background of the study and its purpose, and were aware of the broad range of problems involved. Attendance at these meetings usually ranged between 50 and 80 persons.

The participants, keeping close watch on the study, provided many useful comments, criticisms, and suggestions on technical aspects of the study as well as on presentation, inventory data, and publicity. Many of the participants assisted in the collection of local data, distribution of questionnaires, and informing the public.

## Regional meetings

The three series of regional meetings were scheduled to coincide with the three stages of the study. The Series I meetings introduced the reasons for the study and explained

the methodology involved. The environmental inventory maps were presented at Series II; and the proposed alternative systems and routes formed the focal point of Series III. The purpose of all meetings was not only to report on progress of the study but also to obtain as much direct public input as possible.

Background information, and descriptions of the work done to that point, were distributed at each series of meetings. A list of all materials which was made available at meetings is included in Appendix III.

In each series, a report of the study's progress to date was included for those new to the study. An accompanying slide presentation was followed by a coffee break and questions. Meetings were taped, and all questions and comments reviewed.

At the regional meetings, participants consisted primarily of those living close to the place where the meeting was held. Usually the main concern was with the potential impact of a corridor on their own property or community.

As could be expected, the participants at regional meetings tended to have less knowledge of the technical factors involved, or of the study as a whole. As the program progressed and more specific information became available, so the attendance increased. About 300 persons took part in four regional meetings of Series I; 600 turned

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out to the four meetings of Series II; while the nine meetings of Series III attracted a total of 1,500. An additional 250 individuals attended the five Queens Park meetings of Series III.

At the first series of meetings, the discussion was largely over questions of information. By breaking the meeting into small groups, it was possible for more people to take part in discussion. This informality was appreciated by participants, but at later meetings the number of people was too large for this method. An evaluation of Series I meetings by those who completed question forms gave a satisfaction index of 6.2 out of a possible 10, a relatively good score.

At the second series of meetings, with the inventory maps on display, issues regarding the corridor location began to appear. Owing to some misleading newspaper publicity, many people came to the meetings expecting to see an actual alignment, and tended to be resentful when this was not the case. At several meetings, considerable stress was placed on multiple-use corridors for Hydro and other services. Concern was expressed as to the weighting of data items, the visual aspects of the corridor, and impacts on agriculture and residences. Questions directed to Hydro included the issues of undergrounding, substation design, property acquisition practices, advertising, and future load forecasts.

Open hostility and suspicion emerged only at the Goodwood

meeting where government proposals for a new town, an airport and landfill sites were uppermost in peoples' minds. In spite of these criticisms, however, the satisfaction index for the series as a whole was 5.9, again a relatively good score. Comments added to questionnaires at both the first and second series indicated that concern with Hydro-related issues and the responses provided had tended to lower the scores somewhat from what they might have been if the environmental study had been ranked alone.

The Series III meetings focused on the presentation of alternative systems and alignments, and they were therefore much more oriented toward local concerns. In each locality, the overwhelming majority of people seemed to want the line somewhere else, and tended to make suggestions as to how this could be done. Some of these suggestions proved very useful and resulted in a new systems alternative, as well as a wealth of valuable local details on siting problems. A strong consensus emerged from these meetings in favour of locating the line in the Parkway Belt rather than creating a new separate corridor. At each meeting, a representative of the Ministry of Treasury, Economics and Intergovernmental Affairs was present, at our request, to discuss the Parkway Belt. No attempt was made to obtain participant evaluation of this series but many useful comments were made on the questionnaires, which were distributed to obtain opinions on alternate routes. One of the most informative results of the meeting series was what was learned



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from the types of questions asked repeatedly, many of which concerned Hydro. (At all meetings, Hydro generously provided staff to respond to questions of a technical nature regarding high voltage transmission.) Some of those were concerned with the impact of lines on TV, radio, livestock, farming, fences, trees, crop spraying, water wells, buildings, people, hospital equipment and commercial aircraft. Others were raised about noise from high voltage lines, about Hydro's land acquisition policies; about uses of the right-of-way for trails, gardens, and general recreation; about the impact of transmission lines on land values, not only for those properties actually taken, but those located nearby. The design of transmission towers was frequently mentioned, but not as often as the question of why the lines could not be placed underground. While some people understood the extreme technical and financial difficulties of undergrounding, many could not fathom why engineering of the lines could be managed overhead, but not beneath the ground. To others, the cost of undergrounding was not significant -- burying the lines was thought to be worth the expense. Often during the question period it appeared that if it were possible to place the lines underground much of the criticism would dissipate.

Other questions of Hydro were more far ranging and dealt with advertising policy, the sale of power to the U.S., and the use of electricity to heat homes in an era of impending energy shortages. Some questions dealt with governmental actions related to the study, particu-

larly the Parkway Belt proposal, which some felt was -- or should be -- able to accommodate the five transmission lines without studying other locations.

There were many questions which directly or by implication had a significant value to the study itself. Points raised about the questionnaire led to adjustments in format and analysis procedures. Discussion about locating lines alongside expressways made such sites a desirable goal in siting. Concern with tower and substation design led to the creation of special committees of volunteers who worked with Hydro and B.H.I. to reach conclusions on improved designs and siting practices. Agricultural interests were strongly represented at almost all meetings and opinions about agricultural map inventory categories, crop spraying, siting on lot lines, and the need to retain prime agricultural lands were clearly voiced. Joint use corridors in conjunction with pipelines and railroads was mentioned, as was the use of rights-of-way for complementary recreational, gardening, farming and other uses.

## Publicity

The plan to achieve the fullest possible coverage for the study included regular mailings to every newspaper, radio and television station in the study area. These dispatches included press releases and radio/TV spot announcements as well as background material. Generally the publicity campaign aimed toward a maximum public awareness of the meetings and toward a continued report-



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ing of developments. During the first and second set of regional meetings, members of press present were individually approached and personal contact maintained throughout the study wherever possible. A news clipping service was retained to monitor coverage received from both local and regional press. Advertisements were placed in every paper in the region prior to each series of regional meetings.

A small group of press representatives followed the study from the beginning, attending every meeting. As with the citizens attending Queens Park meetings, these individuals generally represented papers covering communities affected by Hydro's original route. A special press conference was held at Queens Park on June 28 to announce the proposed alternative routes. This meeting was better attended than both the special meetings held for municipal representatives in the prior two days. As well, television and radio crews were present during each of the three series of meetings, and filed news broadcast reports. In several communities, special program coverage by cable television stations is known to have occurred. As might be expected, coverage improved dramatically in the later stages of the study, when there were concrete proposals to describe and lively local meetings to report.

Overall, the extent of media coverage was considerable, stretching to papers as far outside the study area as North Bay, Sarnia and Kingston. A large number of local papers gave week-by-week reports on progress. The media did

a great deal to sustain interest in the study, and their co-operation is gratefully acknowledged.

A mailing list compiled by the Solandt Commission for its 1972 hearings, including Provincial Members of Parliament, provincial government ministries, municipalities, groups, associations and individuals concerned with the original Hydro route proposals, was expanded at the beginning of the study to include all municipalities within the expanded study area, all radio and television stations and all weekly and daily newspapers. The addresses of both province-wide and local environmental and residents associations were sought out and added to the mailing list. As no comprehensive listing was found, some considerable difficulty was encountered in collecting these addresses from a variety of sources. As the study progressed, the mailing list was continually expanded to include those who returned questionnaires. Those respondents were also asked for names of local associations. The addresses of all persons who provided information during the Local Environmental Survey were also added to the mailing list.

At each stage of the study, explanatory background information and progress reports were provided, and advance notices of all meetings held were distributed to all those on the mailing list. To ensure delivery, letters introducing the study, notices of all meetings and information regarding the proposed alternative routes was sent to the municipalities by registered mail. A com-

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plete list of mailings and their contents is given in Appendix V.

## First questionnaire

The first questionnaire, included in a brochure describing the study, was distributed to those attending the first and second series of regional meetings, to those on the mailing list, and, in bulk, to municipalities, groups and associations. Respondents were asked to rank the significance of various factors in routing a transmission line.

There is no way to estimate accurately how many were, in fact, passed on to individuals from the approximately 12,000 distributed in this manner. Approximately 800 of those distributed were eventually returned. A computer analysis of 736 of these gave a fairly clear indication of the relative weights which respondents attached to various environmental features.

The analysis revealed a strong consensus among all respondents that the route should if possible follow existing corridors (78%), that there should be only one corridor rather than two or more (76%), and that it should run parallel to expressways in spite of its being seen by more people (73%). Existing residential areas and homesites were regarded as being the most important feature to be avoided, followed by areas of high scenic value and parks. Least importance was attached to avoiding industrial and commercial sites. The survey gave more or less equal importance to agricultural land, historic sites, rivers

and lakes, and wildlife areas. Respondents did not rate the avoidance of high land costs as being particularly important, nor did potential conflicts with the Toronto-Centred Region Plan or municipal official plans generally rate high on the scale.

As an exception, those respondents who identified themselves as members of an agricultural interest group placed a much higher importance on avoiding agricultural land, while placing a low value on parks, historic sites, vegetation, water, wildlife habitat and scenic value. In contrast these latter features were given an above average rating by those who identified themselves as members of a community interest group and by the small number of responding members of environmental interest groups. Amongst those identifying their affiliation, there appeared to be a very definite divergence of opinion between farmers and the other interest groups regarding the relative importance of natural and aesthetic factors. It should be noted that almost all respondents not stating any group affiliation lived outside of urban areas, and therefore can be assumed to be either rural, non-farm residents, or members of the farming community.

A sample of the questionnaire, and a fuller analysis of the responses are attached as Appendix IV of this report.

In the first questionnaire, persons were also asked to list any features of significance in their locale. These

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items were recorded from the questionnaires, checked against the other inventory maps, and if not shown, included on Map 9, "Local Data Collection". As can be expected, many items were repeated.

As well, individuals were asked to make further relevant comments. A majority of respondents again emphasized the importance of avoiding prime agricultural lands, residential areas, and of preserving the Niagara Escarpment. Other concerns were: preservation of historic homes, family farms, woodlots, and water tables. The effect on land values of a transmission line was often questioned. Undergrounding was a repeated recommendation. Right angle road crossings and the importance of following lot lines were stressed. A binder containing all comments and data items received has been filed with the Solandt Commission.

## Local Data Collection

At the Queens Park meeting of January 4, those attending stressed the importance of obtaining as much local input to the inventory of data as possible. With this in mind, copies of the base map at 1:50,000 scale, along with loose leaf note books containing instructions on how to mark the maps and giving examples of information that would be useful were prepared. A description of the eight other inventory maps and their contents was also included in this kit.

At the first series of regional meetings, the purpose of

these data books and maps was explained, and their importance to the study was stressed. A request was made for volunteers to co-ordinate and publicize the gathering of information in their local areas. In all, twenty-six kits were distributed throughout the study area. It was the responsibility of the volunteers to make these kits known and accessible to their respective communities. Considerable time was spent in the small discussion groups outlining suggestions as to where the maps should be placed. The maps and comments were returned by March 20, three weeks after distribution, when they were mapped for display at the Series II regional meetings.

A list of the responsible volunteers is included in the Acknowledgements. It can be seen that twelve of these volunteers were private citizens while fourteen were elected representatives or appointed officials of municipal government. While those representing municipal government were spread throughout the study area, the private citizens mainly came from areas directly affected by Ontario Hydro's original route. All but one of the data maps were returned with copious notes by the citizen volunteers, but only four of the municipal volunteers returned any data at all.

The data returned varied greatly in subject matter, including mention of scenic areas, prime agricultural lands, historic sites, cultural facilities, woodlots, reforestation projects, airstrips, marshes, watershed



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boundaries, aquifer recharge areas, and areas where a transmission line would be highly visible. The accompanying descriptions were in most cases extremely detailed, for example, giving the architectural detail and background of historic homes, or analyzing the quality and quantity of existing flora and fauna of a woodlot or marsh. Comparative ratings of data significance, detailed maps, diagrams, photographs and items lists were included in many of the replies. In total approximately 400 data items were noted by the over 800 citizens who contributed to the data maps and books.

The Federation of Ontario Naturalists further assisted in the collection of information of local significance. In early March, a letter was mailed by the Federation to every member within the study area. Letters were received from Federation members from Waterdown to Columbus, detailing other natural, scenic, and recreational areas.

All materials received in connection with this part of the study have been filed with the Solandt Commission. Following the Hearings the information will be returned to its source, as in many instances respondents considered it to be of value to future local planning.

## Submissions to the Solandt Commission

During the August-September 1972 Hearings of the Solandt Commission, 103 submissions were received, 26 from municipalities, 15 from groups and associations and 62

from property owners. Each submission was carefully reviewed and wherever possible, local details on land features were mapped in the Local Data Collection Inventory, Map 9. In general, those who made submissions fall into three categories: municipal bodies, those groups with a general environmental interest, and property owners.

Of the 43 submissions voicing opposition to one or another of the original routes proposed by Hydro, the majority of those opposed were resident on the route of which they disapproved.

Nineteen submissions approved of locating the line within the Parkway Belt. This argument was advanced in many cases as an alternative to location in their own community. As well, twenty submissions argued that all the proposed Hydro routes were in conflict with the Toronto-Centred Region Plan, and twenty-eight submissions stressed conflict with the municipal Official Plan, itself contingent upon provincial planning to date.

More than thirty-five submissions noted the potential conflict with agricultural issues. These arguments were often accompanied by a concern for total environmental impact, and overall regional attractiveness.

By far the greatest proportion of submitted remarks were concerned with the factors of scenic and environmental impact. Strong concern was expressed as to the



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# Public Participation

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aesthetics of tower design and the necessary widths of the rights-of-way resulting from Hydro's current construction practises, selective cutting notwithstanding. The argument was advanced in several submissions that municipal or provincial bodies should have power to monitor right-of-way construction to ensure that practice did not fall below principle.

Although a concern for the effect of a Hydro corridor on an individual's holdings or his immediate locale or within the boundaries of a municipality was an observable force behind many criticisms and suggestions, self-interest in the narrow sense was certainly not the only factor which provoked comments. Those who made submissions most frequently showed an informed awareness of and concern for the larger social and environmental issues of such a corridor.

Among the central questions raised by the disunity of the submissions as a whole was the strong need for local co-ordination and co-operation. A general concern with technological growth and urban sprawl supported arguments for better self-review within communities; and the need for much greater co-operation between municipalities and Hydro as to the permitted uses of constructed rights-of-way.

## Correspondence

During the course of the study up to the third series of regional meetings, letters were received from individuals

and groups throughout the study area. In addition to requests for additional information, many of the letters included specific local data which was recorded and mapped. In general, comments received by mail reiterated those concerns most often stated at meetings: concern with disruption of agricultural use, decreases in land values, destruction of scenic quality, the advantages of joint corridors, and the Parkway Belt as a suitable location. Other comments referred to radio, television and airstrip interference, undergrounding, right-of-way width, construction affect on water tables, land acquisition practises, method of transmission, and the ramifications of the increasing consumption of electricity. Following the second series of regional meetings, letters and numerous phone calls were received giving detailed information to be added to the inventory maps. As with more formal submissions the correspondence we received from individuals expressed a deep concern for the direction and management of "growth" in the study area, and the processes by which decisions on growth are made.

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# Public Participation

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## Toward a methodology

Citizen participation in the planning process represents a new approach to decision making. There is, at present, no agreed optimum means of incorporating effective citizen participation in regional planning programs.

Citizen participation involves experimentation with new ideas and the assumption of new roles -- both by planners and citizens. Perhaps, as stated in a submission to the Solandt Commission, what is required is "...an attitudinal revolution; a revolution that can come about quietly, through participants, both within and outside government, being part of and learning from a continuous series of experiments in participatory planning."<sup>\*</sup>

This project represents one experiment in participatory planning -- made particularly complex by the interrelationships or provincial, regional and local perspectives. Generally, the public's view tends toward localism, while the problem of locating a transmission line is regional in context. Meshing the two perspectives can be difficult. The program developed for this study has attempted to reach beyond old line communication with elected representatives, the public and governmental agencies. As such, it represents an experiment leading to new ways for involving people in decisions vital to their welfare.

Several thousand individuals have taken part in this study in one manner or another. The majority of these have been property owners, directly concerned as to the effect

of a transmission corridor on their personal property and their immediate environment. Understandably, a large number of participants were primarily concerned with keeping the corridor out of their area, and were not too concerned with problems involved with other locations. But many individuals were aware of the total regional complexity of the problem and were willing to comment within this framework.

If citizens are to perform in any advisory capacity involving their time and effort, then citizen views and ideas must result in some perceivable change in programs, if participation is to continue. Citizens themselves must also reach out beyond purely local concerns and be willing to assess and accommodate divergent aims if a practical regional approach is to be achieved.

For future regional projects, one suggestion might be to establish a citizen's committee at the outset composed of a cross section of interested citizens from all walks of life and from the various areas of the study region. Such a group could encourage participation within their locale, and add to the credibility of the program. In addition, this group would be most important in defining goals and

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<sup>\*</sup> John Graham, Reflections on a Planning Failure, A submission prepared for the Solandt Commission, September 20, 1972.

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objectives for such a study on a regional scale. From this broad understanding of the problem, a committee could then be instrumental in involving local groups in the study and in the recognition and resolution of divergent local concerns.

From the outset, the participation of municipalities in this study has been considered most important. Local governments are closest to the public in theory at least, and aware of local issues. During the course of the study, a number of municipalities consistently maintained interest. Citizens were appointed to monitor progress by some councils and they met with local groups, talked to local press, and sent representatives to every meeting. The majority of municipalities, however, expressed interest only during the Series III meetings, usually since it was apparent that an alternate route may affect their particular community.

This study appears to have helped spur a demand for participation in local decision making. Possibly the desire to have a direct voice only evolves when citizens are threatened by projects which may have a potentially negative impact. In any case, groups formed as a result of this study should influence the process of decision making in their communities.

The media also played an important role in this study. In general, media coverage has been more than satisfactory. Coverage was varied in quantity and quality, from

area to area. Too often, however, the local press simply reports events. The press could aid significantly however by encouraging awareness of, and soliciting participation, in local programs from their inception. This motivating role should apply to regional issues as well, since the local press interprets the immediate relevance of regional programs within their communities.

Sufficient information is an essential prerequisite to citizen participation. The organization of an effective program involving an extensive area, and a dispersed citizenry requires a great deal of time. The time available for this entire study was based on the stated need of Ontario Hydro to have a decision made by the end of 1973. To do this, the study had to be completed in eight months, from January through August of 1973. Due to this extreme time constraint, the periods available for sampling opinion by questionnaire and through the collection of local information, were too short. The development of an intensive network of communication in communities is time consuming. The problems of informing individuals, by means of the press, or through any method of mailing, are great. Information alone is not enough -- there still exists the problem of getting people involved. It has been stated that the "silent majority" is, by definition, "silent", and will remain so. It may also be said that generally people do not become involved until it appears that their immediate concerns may be in jeopardy.

It is easy for people to criticize and raise questions; the

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difficult task is to develop an effective program to help resolve the issues that must be faced. Approaches can be varied and could include: citizens committees to evaluate success of meetings and guide programs, brochure distribution, questionnaires, random opinion sampling, highly visible information programs, meetings, and speakers bureaus for interested groups. The majority of these methods have been included in this program. Because of the study's time constraints, difficulties occurred in the information distribution process, and in questionnaire design and analysis. In future studies Hydro should allow more lead time to work out such problems in detail, to contact and co-ordinate with local groups, and to ensure that publicity is as widespread as possible.

The credibility and relevance of this particular study has, from the beginning, been hampered by the previous Hydro proposals. Even with repeated comments that a total re-study of the region was underway, it was most difficult to obtain participation by the public, municipalities and press in areas not originally affected by Hydro's middle route. As well, some public hostility to Hydro, based on past experience, hindered the study's credibility. Little recognition was given by the public to the changing attitude occurring at Ontario Hydro, and to the significant contributions Hydro was making to the study. These factors should not apply in future transmission line studies.

this study, both positive and negative, will aid in the development of future methodologies for participatory planning.

This study has demonstrated that the public can contribute to a complex planning program. Hopefully all aspects of



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# Response to Alternate Routes

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## Provincial Ministries

Submissions were received from eight Provincial Ministries regarding the proposed alternate routes. Responses ranged in content from detailed considerations of the various alignments to concern for the regional implications of the alternate systems.

A submission from the Planning Division of the Ministry of Transportation and Communications stated that "the Ministry is in agreement in principle with the concept of multiple-use corridors". By combining the various uses into one corridor, a minimization of environmental costs, social costs, acquisition costs and aesthetic costs should result. Also the concept appears to have general acceptance by the public.

However, the Ministry also expressed concern for "... certain technical details which require resolution" such as "... salt action on conductors and Hydro towers, electromagnetic induction effects on automatic equipment use in future transportation modes, access by Hydro to the transmission lines, etc."

Also, it maintained that "...under certain circumstances and at certain locations the multiple-use concept will not be practicable...and should be avoided". Also, "...the Ministry will emphasize its concern for the aesthetic quality of the interfacing of its facilities with Hydro lines"

Subsequently the brief outlined current plans which may

be influenced by any of the corridor proposals, noting specific areas which they had identified as being significant.

With regard to the proposed Highway 407, the Ministry noted the Conservation Areas at Claireville and Milne, a unique Maple Woodlot at Bathurst Street and Langstaff Side Road and the built-up area on the south side of Highway 7 between Yonge Street and Bayview Avenue. In addition, potential impact areas for a highway/hydro multiple use corridor were outlined, including proposed parks included in the Parkway Belt, the Humber Valley, and highway interchanges along the Highway 404 alignment. The effect on a golf course was also noted.

Regarding the Parkway Belt, the brief reiterated the reasons set forth in 1970, as to why the Middleport to Pickering corridor was not feasible at that time, including "height restrictions near the Toronto Airport; security of the provincial electrical system under jeopardy if too many lines consolidate within one corridor; land costs extremely high in this corridor; social disruption would be higher here than in a northerly corridor; and serious aesthetic risks to large populations".

Concern was expressed with regard to the Highway 401 crossing of the Niagara Escarpment. It was stated that the crossing "...would be highly intrusive on the area and would be aesthetically unpleasing to a large population of highway users in addition to park users".

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## Response to Alternate Routes

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The Energy Branch of the Ministry of Consumer and Commercial Relations favoured the joint use of gas and oil pipelines and Hydro lines. It stated that System S or T would be the most acceptable since "the main interest of this Ministry is of course to ensure that customers are supplied with Hydro at low cost provided the route interferes as little as possible with present and future land use. The installation of specially designed towers except in a very few selected areas also seems to be a luxury the customer cannot afford when we are talking in millions of dollars". The Ministry also believes that "...the corridor should go through marsh land rather than deliberately avoid it and follow farmland, as we do not believe that a Hydro line through a marsh interferes with nature for long".

The Ministry of Agriculture and Food stated that "...the interest of agricultural production will be best served if high voltage transmission lines could be restricted to corridors consisting of other energy and communication lines and that where at all possible these energy corridors be located on the lower grade of agricultural lands. It is also our view that transmission lines where possible be located on or adjacent to green belt and parkway areas.

The Ministry "... recommends that alternate Route R be selected for this 500 kV transmission line".

The Official Plans Section, Plans Administration Branch, Ministry of Treasury, Economics and Intergovernmental

Affairs, submitted a detailed outline of the impacts of each alternative on designated official plans and zoning restrictions.

The Historical and Museums Branch of the Archives of Ontario noted on the 1:50,000 scale maps "...the location of some 72 historical/historic structures and sites of various kinds which lie more or less in the immediate vicinity of one or other of the alternate route systems". They state that "purely from an historical viewpoint, it would appear that of the alternate systems originally proposed, route "R" would have been our choice, but since we understand "R" cannot now be considered", the Historical and Museums Branch favours alternate route Q.

A very detailed submission was received from the Regional Lands Coordinator, Ministry of Natural Resources, stating that "Route R (or a Modified Route Q) through Woodbridge would have the least impact upon the natural resources within the study area of the Solandt Commission. Although each route does have environmental costs, the benefits of Route R are significantly greater than any other alternative".

The brief outlines the advantages of Route R as follows:

"...avoids crossing of headwater streams and wetlands" and the "removal of vegetation in wetland areas" which would "...increase runoff resulting in possible flood conditions downstream,

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## Response to Alternate Routes

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and would subject the streams to potential sedimentation, and warming conditions which would adversely affect fish and wetland wildlife habitats. All of the routes require special attention to be given to the crossing of wetlands associated with Spencer, Bronte, Galt and Oakville Creeks .

Route R avoids known sensitive areas having unique physical, biological, or historical features." The brief indicates such areas where routes S or T would have "potentially adverse effects". Also noted are places where special precautions should be taken in the routing of R and suggestions are made for realignment.

With regard to conservation authority lands, "...it is felt that the impact (of route R) to these lands would be less than the impact upon lands elsewhere on the Escarpment or on the Oak Ridges Moraine, particularly those lands proposed for recreation development. Towers adjacent to or on...authority lands should be positioned to allow full access and minimum disruption to the authority operations..."

"Route R avoids crossing the Escarpment in areas having predominantly rural characteristics. Although the route R crossing of the Escarpment will have a visual impact upon the intensively used Kelso area, this impact should not be as great as those lands not already adjacent to a major freeway and rail transportation line". It states that "...confining linear services to one corridor, will

allow for the possibility of a high quality recreation experience...in other areas" and that"...using the land between two upland portions of the Escarpment will reduce the possibility of the Hydro towers' presence on the skyline. Finally, the presence of the S or T hydro crossing and the Bruce hydro corridor along the edge of the Escarpment to the Halton Station would detract from the fifteen mile Escarpment, farmland, and Credit River Valley vista offered from the Credit Valley scenic drive and the Bruce Trail...

Route R reduces the amount of wooded land and farm woodlots crossed". Also it states that Route R "...offers possibilities for on-site recreation uses such as picnicking, hiking, nature viewing, bicycling, and offers these possibilities in areas having a high demand for recreation space.

...Route R does not offer the same skyline domination characteristics east of the Niagara Escarpment as do routes S and T.

...Route R has fewer changes in routing, and as a result would appear to require fewer angle towers. This would result in less visual impact". In addition, "it is our opinion that any loss of land from agricultural uses to Hydro would be felt less along Route R. Zone 2 of the Toronto-Centred Region could remain generally free for large scale mechanized agriculture, unencumbered by hydro line crossings.



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## Response to Alternate Routes

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In our selection of Route R we acknowledge that Ontario Hydro has indicated a systems security problem in the location of the Bruce and Nanticoke hydro lines adjacent to one another. However, in our opinion, not enough evidence to cancel this option has been given, particularly when viewed in light of those benefits listed above that relate to the crossing of the Escarpment."

The brief outlines Ontario Hydro's reasons for the "Parkway Belt" route being less desirable than their "middle" route as: (1) "the need to acquire and remove more buildings than the more northern routes; (2) the need to affect more owners in acquiring the right-of-way; (3) problems with...the height zoning area of the Toronto International Airport; (4) visual problems with crossing the Escarpment in the Speyside area; (5) the need to modify plans of developers adjacent to the Parkway Belt..." and finally (6) "the problems associated with finding available room in...the Parkway Belt."

The Ministry states that "in spite of the above problems, we believe that by locating the 500 kV lines as a component of the Parkway Belt "Northern Link", the Province of Ontario would demonstrate its ability to successfully implement an important element of the Toronto-Centred Region concept..."

Finally, it is expressed in the brief that since "...the Middleport to Cherrywood 500 kV are scheduled to be constructed approximately ten years prior to the proposed

Highway 407...excellent possibilities exist to minimize the visual impact of the hydro towers and lines on the motoring public. The use of grade separation, berms, landform modification, vegetation plantings and right-of-way separations should tend to reduce any adverse visual impact and should provide other points of interest."

A lengthy submission from the Ministry of the Environment was not received in time for a detailed summary to be included in this report. Generally, it outlines the background and basic concerns of the Ministry, assesses the alternative alignments and summarizes with the following conclusion on a route.

"An alignment which seems to be emerging as environmentally least offensive is: Middleport-Georgetown (45b)-Halton-Parkway Belt-Pickering. However, there would appear to be technical issues requiring immediate resolution with Ontario Hydro on the matter of security, if the environmentally least objectionable alignment is to be selected."

### Conservation Authorities

Submissions were received from five of the seven conservation authorities included within the study area.

From the South Lake Simcoe Conservation Authority a brief details the impacts which a system T would have within their jurisdiction and recommends system Q as "the route of least environmental impact".



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## Response to Alternate Routes

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The Hamilton Region Conservation Authority commented on the various proposed routes within their area and suggested that any type of development which might disturb watercourses should be handled with great care, in co-operation with the Authority.

The Credit Valley Conservation Authority submitted maps showing their property purchases and areas of acquisition affected by the alternate routes and recommended their preference as being the southern route along the Parkway Belt.

The Halton Region Conservation Authority submitted a review of the alternate routes stating that "the Beverly Swamp should not be traversed by this power line" and indicated feasible alternative routes adjacent to the Swamp. They expressed concern for the impact a transmission corridor may have on the headwaters of their watercourses and the "large identifiable units of undissected high quality agricultural land" within their jurisdiction.

They recommend essentially following system R with a proposed alignment change in the vicinity of the 401 crossing of the Niagara Escarpment.

A submission from The Metropolitan Toronto and Region Conservation Authority, which is traversed by each alternate system, outlines the effects of each route on their lands. System S would have "the least conflict with

our programmes and policies and hence is the alignment which is acceptable and recommended". They state that "...alignment Q could be acceptable to this Authority" with the qualifications that the alignment be reconsidered with regard to the Claireville Conservation Area, the Thackeray Landfill Site and the Dalziel Barn Historic Site.

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# Response to Alternate Routes

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## Ontario Hydro's Brief

Upon receipt of a copy of the alternate route proposals map, Hydro undertook a review and prepared a brief outlining their concerns. It was indicated that "Ontario Hydro is willing to accept any route providing adequate consideration is given in its selection to the environmental, engineering, social and economic factors and that the lines can be constructed in time to meet the requirements of the power system".

Hydro restated their engineering requirements, including the number of lines required on each corridor, in service dates and right-of-way widths. The number of stations, their general location and construction access requirements were noted, together with the need to keep corridors separated so as to maintain electrical security in the Hydro system.

Hydro restated and underscored the need for timely approval to secure the needed right-of-way. Noting that a change in Hydro policy to carry out detailed siting studies with public participation on all other new Hydro lines had resulted in delays of up to 30 months in in-service dates, it had been necessary for Hydro to resort to stop-gap construction of 230 kV facilities, accelerate property surveying and introduce special equipment in order to maintain proper service. Even for stop-gap facilities however, problems may occur due to possible delays in provincial and municipal governmental approvals.

Hydro's own questionnaire survey findings matched those of the B.H.I. survey indicating that people preferred double circuit towers which while higher, require less width for the right-of-way. Hydro's survey indicated that comparatively few people of those they interviewed would be willing to pay more for towers of "more pleasing appearance". Hydro's guidelines for the use of improved appearance towers was presented, along with a comparison of the number of different types of towers on each alternate, indicating the desire to use caution in frequent changes of line direction because of increased power costs.

Stations are the most expensive part of the system, costing more than the lines themselves. As a step in reducing station size, Hydro stated that advanced SF6 switchgear would be adequately developed for installations in their system for 1980 and beyond. Taking this technological advance into account, together with an allowance for landscaping around each site, Hydro prepared calculations of site areas required for each station indicating a range from 2,900 feet by 2,400 feet to 1,400 feet by 1,400 feet. Railway spurs would be required to each station in order to bring in transformers estimated to have a shipping weight of 350 tons. Items of this weight cannot be moved over Provincial highways. Hydro reviewed possible station sites presented under each alternate routing scheme and suggested changes or modifications to improve site desirability.

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## Response to Alternate Routes

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Comments on public participation by Hydro indicated concern with the negative attitude expressed toward new Hydro lines in any area, a lack of representation for the travelling public, and the difficulty of public response to the various route alternatives because of the "unavailability of environmental and technical data for those alternatives and information relating to Hydro policies on property, engineering, forestry, etc".

Hydro discussed the various alternative routes from the environmental standpoint, noting the various options for crossing the Escarpment while still maintaining system reliability. The visual problem of paralleling highways in the Parkway Belt was pointed out together with Hydro's concern for prompt approval if this route were selected. No insurmountable problems were found concerning radio station interference. The amount of diagonal severance was noted by Hydro as being more on the B.H.I. routes than on Hydro's and that less Class 1 and 2 soils and less woodlots would be affected by the Hydro route.

A detailed review of major watercourse crossings and sensitive areas for each alternate route was presented in the Hydro brief. This data will be useful in detailing the steps to be taken in final siting of the line and the related treatment of the right-of-way. Problems of paralleling highways were also noted, including increased visibility of the line in rural landscapes requiring careful attention to tree cutting, new plantings to screen the view, and more careful maintenance practices.

A review of costs was presented by Hydro, with estimates or property acquisition, line cost, station cost, and communication facility mitigation separately estimated for each alternate. According to Hydro's data, the least cost route would be their previously proposed middle route, followed by routes S and T, with route Q the highest cost. To meet their schedule, Hydro also indicated required route approval dates for various parts of the line beginning in January 1974.

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# Response to Alternate Routes

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## Municipalities

Submissions were received from twenty-seven municipalities in the study region. While many of these submissions consisted primarily of resolutions approved by Council, others included detailed staff reports on alternative alignments within their jurisdictions. The following is intended only as a brief synopsis of these submissions.

### *Ontario County*

The Township of Pickering Council and Planning Board recommended the southerly route entering into their municipality from the Borough of Scarborough, connecting directly to Cherrywood Transmission Station. This route was previously favourably considered "providing the line be realigned alongside the Canadian Pacific Railway".

The Town of Whitby recorded its opposition to System T which would disrupt the Oak Ridges Moraine as protected by the new Official Plan, existing rural hamlets in the north portion of the Town, as well as creating an additional parallel corridor through the Town. The new Official Plan designates approximately one mile of Parkway Belt (within which the present Gatineau Line is located), for transportation and utility rights-of-way as well as for recreation and conservation uses.

### *Metropolitan Toronto*

The Borough of Scarborough Board of Control reiterated its previous comments as to the unacceptability of new transmission lines through the Borough and further ad-

vised that a "...new alternative route along the HEPC Brooklyn Line from Pickering to McCowan Road, and northerly halfway between McCowan Road and Brimley Road would have considerable adverse effect on lands in the Borough planned for industrial and residential urban development..." and would not be acceptable.

The Metropolitan Toronto Planning Board submitted a staff report which detailed the adverse impacts upon planned residential and industrial areas of the most southerly option crossing the Borough of Scarborough. The brief compared two alternative alignments between Parkway and Cherrywood in terms of their impacts and the respective distances these alternatives would have to parallel the existing Finch right-of-way. It also listed the impacts of a more northerly alignment in the Town of Markham. It noted "...that it would be feasible to include the complete line through the proposed Provincial Parkway Belt system; and that although not yet publically announced, "...it is expected that the Parkway Belt (east of Markham Road) could include the Rouge River valleys and the east-west Hydro rights-of-way into Pickering". The Metropolitan Corporation therefore recommended the most northerly alignment for System Q between Parkway and Cherrywood stations.

### *Regional Municipality of York*

The Township of East Gwillimbury stated its definite preference for System Q. If this route is accepted, the Township noted that the effect a more northerly route would



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## Response to Alternate Routes

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have on the Roger's Reservoir Conservation Area and good agricultural lands would be eliminated. It was noted that "...System Q could utilize existing Hydro corridors and CNR rights-of-way and would be advantageous to the existing and future industrial areas of Vaughan and Markham. In reference to the northern route from Parkway Station, the alignment along the proposed 404 should not prove objectionable to the Township, although further studies would be required to determine the exact location of the corridor and substations".

The Township of King recorded its continued opposition to the proposed Hydro corridor crossing any part of King Township. The Council recommended "...that Ontario Hydro in conjunction with the Province of Ontario should construct the proposed Hydro lines in the newly created Parkway Belt which has been created for public utilities such as Hydro tower lines". The Council voiced its past opinion that the line "...should be located in a type of service corridor rather than across the scenic and ecologically delicate areas of the Province". It noted that "...the Parkway Belt is basically designed to be a public utility corridor", and that its use would save "...thousands of dollars to the people of Ontario", (as) "Hydro will not have to expropriate other lands as well as the Province expropriating Parkway Belt Lands".

The Town of Markham endorsed a staff report detailing the ramifications of the various routes to the Town. The brief detailed the extensive restrictions and losses of

development lands in the Town due to previous Government actions; amounting to 68.9% of the total acreage of the Town. It noted that while the proposed alternative routes are partially contained within the lands accounted in this, "...there are portions outside these (areas) and will mean additional loss". Concern was expressed regarding the effect of a corridor creating barriers between various communities in Markham, creating isolation and urban fragmentation. The impact on the scale and character of quiet estate type rural residential communities was stressed, such as Devil's Elbow, Buttonville, Box Grove, Cedar Grove and Hagerman Corners. The brief also expressed concern as to the "...possible despoilation of the natural features of the Rouge Valleys in south-eastern Markham, displacement of forest areas, ... potential for erosion damage", "adverse effect on golf courses", "impact on views from vantage points", and on the effect of the towers on aesthetics, and "...a possible conflict with Buttonville Airport". The brief stated that the Town's viewpoint was basically the same as submitted earlier to the Solandt Commission, and that the imposition of the additional constraints of the Parkway Belt has emphasized this. The Town stressed its inability to "...view with equanimity the gradual erosion of its ability to plan effectively because of decisions taken by other levels of government". Therefore the Town considered itself constrained to select an alignment "...which involve minimum intrusion into its boundaries".

The Town recommended System T with the alternative

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## Response to Alternate Routes

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linking directly to Oshawa from Newmarket. This alignment was felt to pass through an area "...not presently built up, unlikely to be so in future. This alternative also would eliminate a direct link between Parkway and Cherrywood through Markham, a link which traverses many rural residential communities...", as well as "...some of the most unique open space areas associated with the Rouge Valley system". In regards to a north-south route between Newmarket and Parkway, the Town would prefer the alignment following the 404 corridor, and an existing 230 kV transmission line in Markham, -- which was felt to have the minimum additional impact in the Town.

The Town of Richmond Hill submitted a staff report which evaluated in great detail the alternative alignments as they affected Richmond Hill. The brief compared the segments of five alternative alignments giving length of each alignment, acreages affected and main features of each route. The brief evaluated each alignment in terms of topography and land use, Official Plan and zoning, and other plans, listing detailed aspects of lands within each alignment and in the vicinity, and applied weights used by B.H.I. Limited to each feature.

The summary and conclusions of this submission are recorded as follows:

"In reviewing the alternative routes proposed by B.H.I. Limited, the Town of Richmond Hill is mostly concerned with alternative S. The two paths that this alternative

could take within our boundaries are totally unacceptable. The crossings of Yonge Street occur in the vicinity of the height-of-land, which is aesthetically and ecologically the worst place for it."

The most southerly optional alignment of Route S "...traverses through areas which would not support the Hydro corridor if the B.H.I. scale of relative weights was adhered to. Particularly the north-south portion of Route S. However, this alternative was proposed in order to get around the Buttonville airport and avoid a conflict therewith. If the runways of this private airport are extended the alignment of Route S will be shifted further west towards Bayview Avenue, thereby becoming even less acceptable as it would not follow the farmer's lot line and may put numerous farms out of production. This alternative has an additional unacceptable feature of running through an area which in the near future could become the most suitable location of residential and industrial development in Richmond Hill."

The most northerly optional alignment of Route S "...runs through the vicinity of Philips and Bond Lakes and the Oak Ridges Moraine. Almost the entire alignment cuts through the natural habitat of a large population of wild animals and fowls. It is one of the closest wild life reserves to Metro Toronto. This route also runs through the recharge area of the Rouge river watershed. Any changes of the natural setting in this sensitive location could have far reaching and irreversible effects on the entire river basin.

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System Q must be located within the Parkway Belt corridor. This corridor must be widened to accommodate the hydro corridor. Parallel utility lines which are not grouped together are bound to have undesirable effects on their environs. They also constitute an unacceptable waste of serviced land.

System T should logically be located between the two major north-south vehicular arteries of Highway 404 and the 4th line (Don Mills Road). This location would have the minimum disruptive effect on the agricultural community, particularly in the 3rd line area. By virtue of its accessibility, the corridor created between these two roads, should be used -- as much as possible -- as a utility corridor for linear public services."

The Town of Vaughan Council submission discussed the provincial concept of the Parkway Belt and its goals to separate and define communities while providing open space, and to contain a service corridor including various utilities such as an expressway. The Town noted that it "...agreed with the concept while disagreeing with the proposed location of the Corridor in Vaughan".

The brief noted that subsequent to Vaughan's stated position concerning the Parkway Corridor, the Solandt Commission began hearings, and it became evident that the choice of Ontario Hydro and the Province of Ontario to route the line through King Township was deemed most unacceptable by the residents thereof. It stated that

"...pressures were then being exerted to have the proposed lines moved southerly into Vaughan". It was noted that "...Vaughan took the position that: (1) Vaughan concurred with Ontario Hydro's and the Province's wish that the right-of-way be located in King Township; (2) that should it be found expedient to place the lines in Vaughan, then the lines must be entirely included in the Service Corridor within the Parkway Corridor, and not in the northerly part of Vaughan; and (3) the public be given every opportunity to voice its opinions concerning the tower lines". In particular, the brief noted the Town's opposition "...to the proposed tower lines passing through the heart of the Thornhill-Vaughan Community and crossing two golf courses within that Community". The brief reported that the Toronto-Centred Region Plan has indicated that the Thornhill-Vaughan area will become urbanized, with a potential population of 55,000 to 61,000.

Previous to receipt of this resolution, the Planning Director of the Town of Vaughan had forwarded a copy of Vaughan's proposal for the location of the Parkway Belt in that municipality. In the accompanying letter, it was noted that this preference was stated before the Solandt Commission was formed and that the possibility of a Hydro route through Vaughan further enhances this preference as it could easily be accommodated. It was noted that the Parkway Corridor merely followed the Highway 407 alignment which predated the Parkway concept and that this applied also to the proposed Hydro corridor. It noted that a transmission line had never been considered for a location this far



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## Response to Alternate Routes

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south in Vaughan and that this decision "...may be based on the flimsiest of reasoning". It noted that their reasons for alignment of the corridor are on file with the Province, and that it was felt this alternative alignment for the Parkway was as environmentally acceptable as the more southerly route, and that "...from an operational point of view, Ontario Hydro may prefer this route to the more southerly route since it is not as encumbered with natural and man made features".

The Town of Whitchurch-Stouffville recorded its objections to the alternative alignment from Newmarket to Oshawa which runs east-west through the Municipality. This alignment was stated as contradictory to the established preliminary goal of the Regional Official Plan of the Regional Municipality of York. This goal stated that for rural areas the objective is "to minimize the visual impact of utility lines and encourage the multiple use of their rights-of-way wherever possible in co-operation with appropriate authorities". This route was also considered unsatisfactory in that it followed a very scenic height of land with limited tree cover and would be most visible to drivers and residents in this area, obstruct scenic views of Lake Ontario, cross prime agricultural land, and would adversely affect the valuable gravel pit operations in the area, and possibly discourage proper rehabilitation of them. It was noted that "...the tree coverage which does exist on this alignment is choice hardwood bush which should be preserved in its natural state".

The Town also objects to any alternative alignment which runs along the east side of proposed Highway 404 through the municipality. This route was reported to have "...a severe visual impact on the existing communities of Wesley Corners, Vandorf and Gornley, have adverse affect on the growth and proper development of these three communities", and in combination with the Highway 404 alignment "...would have a severe impact on the natural rural landscape". The brief suggested that "...assuming that a corridor must run along Highway 404, the alignments of the existing CNR line and Highway 404 dictate that it should run along the west side of the proposed highway. This would also affect the minimum number of people and avoid injustice to the residents of Don Mills Road".

The Town noted that both routes run through land that is ideal for estate residential development which can be blended with the natural landscape, and which would obviously be discouraged by a hydro corridor. The Town is of the opinion that its most "...valuable asset... is the scenic estate type land where high assessment would provide much needed revenue to ensure the future well being of the Town". The Town voiced its strong objection to these alternative alignments "...which would have such adverse environmental and economic effects on the Municipality and its residents".

A personal brief was also received from the Mayor of Whitchurch-Stouffville, stating his preference for System Q on the basis that substations in this system were adja-



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cent to areas being currently developed and it avoided natural areas important to evolving Regional Open Space -- Rural Development policies. He agreed with the desirability of a Parkway Belt containing a multiple use service corridor, and the intent of the Toronto-Centred Region Concept. It noted that Systems S and T are unacceptable because they cross areas of high recreation, scenic open space, and rural residential potential in the Region of York. In contrast, System Q was felt to utilize to the greatest extent, of any alternatives, existing Hydro and rail rights-of-way; and proximity to existing and planned industrial areas -- therefore obviating extensive transmission lines to specific industrial sites. The brief also contained very detailed recommendations concerning the actual routing of System Q from Woodbridge Station to Cherrywood, and for the proposed alignments north from Woodbriedge and Parkway stations.

### *Peel County*

The Village of Bolton Council recommended that the Hydro line "...be placed in the Parkway Belt where Hydro could set a good example to other utilities to do the same". It was noted that the two northern routes "...pass through some of the most productive farm lands in Ontario", which is critically important, and therefore that "...this is a major point in locating the line to the south". It was stated that "...the main purpose of the Parkway Belt on the southern route should be to facilitate handling all services such as Hydro, telephone, gas, etc., at the most economical cost, while giving conservation and open space

to people living in the vicinity". It was also noted that "...the southern line seems to be more direct with less angles and would therefore be preferable from a cost standpoint".

The Town of Brampton Council supported the utilization of the Parkway Belt alignment provided that the problem of width could be resolved. It was noted that the width required for a 407 Highway and the Hydro right-of-way would appear to overfill the Parkway Belt as previously designated. It was also stressed that in using this alignment extreme care should be taken in the detailed siting of the line to avoid damage to open space areas and creek valleys.

The Council recorded its opposition to a route adjacent to the Town which would prevent the satisfactory completion of a residential neighbourhood designated by the Official Plan and to links which pass through the "City of Brampton" in the new Peel Regional Municipality, as "...utilization of these links would prejudice the urbanization of the Area Municipality as plans cannot be developed for it until the regional reorganization takes place".

The Township of Chinguacousy Council enacted a resolution stating that the Township favours the southern route for the 500 kV line.

The Town of Mississauga Council submitted an adopted staff report. The Council recognized that the proposed transmission line is necessary, and that inconvenience

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## Response to Alternate Routes

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will be caused in whatever location the line is placed. The Council advised "...that the geographic area of the Town of Mississauga is an unsuitable location for the establishment of the proposed 500 kV transmission line".

The submission detailed areas which should not be considered as possibilities for the alignment. These areas were illustrated on an attached map in addition to 'lands for which future development plans have been approved', 'lands for which plans are awaiting approval', and 'lands for which future development is under consideration'. It was stated that "...the ill effects on present or soon-to-be residents of the Town by placing the proposed line in developed or developing areas apply equally to future population and therefore any area of the Town for which there is development potential should be automatically removed from consideration". In regards to the Parkway Belt, it was noted that the southern Parkway link was of inadequate width, and in a developed area. It was recorded that the future population of lands adjacent to the northern Parkway line could be as high as 100,000 with complete development. It was also noted that any location "...for the proposed 500 kV line north of the present Hydro line would present a possible conflict with the operations of Toronto International Airport".

The Town of Streetsville Council noted their strong support in the past that the 500 kV transmission line from Middleport to Pickering be included in the proposed Parkway Belt. The Council noted that as the Parkway Belt,

"... which was originally planned to be at least one mile wide... has been drastically reduced to some 800 feet in width in this area", that they "... seriously questioned the advisability of the inclusion of this Hydro transmission line in this very narrow corridor". Therefore, the Council recommended "... that the Provincial Government reconsider the width of the Parkway Belt so that the 500 kV hydro transmission line can be included in the proposed Parkway Belt".

The Township of Toronto Gore Council stated unanimously that "... no further Hydro rights-of-way, other than those to serve the local interest, should be constructed in the Township". The Council stated its opposition to the proposed establishment of a Parkway Belt in the Municipality. Copies of proposed Official Plan amendments were included, and the conflict between these proposals and the alternative alignments stressed.

The Council submission also noted that the ratepayers had been consulted, and a petition with 500 signatures was forwarded by the Township Offices. This petition from residents and landowners in Toronto Gore stated their objection to the proposed alignments in the Township north of the Parkway Belt. It stressed that the proposed estate development in north Toronto Gore, namely Amendment No. 5 to the Official Plan "... would be severely curtailed if not obliterated" by these alternatives. The petition recommended that an existing Hydro right-of-way between Kleinburg and Woodbridge, just east of the Township would

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be a logical connection between these places. The petition noted the present consumption of acreage in the Township by a gas transmission line, a large conservation area and the Parkway Belt. It noted strong opposition to the alternative corridors which would seriously affect land use and values. The petitioners recommended that the transmission line be constructed in the Parkway Belt south of Steeles Avenue, in order to prevent the disruption of arable land.

The County of Peel Council, in an approved resolution, stated that the County wished "... to be assured that any recommendation as to the route of the proposed major Hydro transmission line not indicate any land between the proposed line and the proposed 407 Parkway Belt, if the latter is to be utilized for the transmission line".

### *Halton County*

The Town of Burlington Council recommended that System S either single or in combination with System T is the preferred route. The Council also stated that System Q especially the Escarpment links through Rattlesnake Point and along Highway 401 "...negates and contradicts the basic criteria for the establishment of the desired routes and is therefore recommended for total rejection". The submission noted that the Q system affects Burlington in the area of the Escarpment below No. 10 Side Road and in the Kelso area north of Highway 401. The environmental impact was noted as high, "... in that it would impinge on the majestic natural views from Rattlesnake Point, Mount Nemo, and even Highway 401". The Q System was

regarded as traversing "... the open and best agricultural lands of the area". The brief stated that the S and T Systems, the more northerly, are considered to have "...the least impact on the environment, land uses both present and future, including the least visual impact".

The Township of Esquesing Council endorsed the brief submitted to them by the Esquesing Solandt representatives appointed by Council to monitor the study. The Council endorsed "...a West-East Route from Middleport to Halton via the Escarpment south of Rattlesnake Point, and connecting to Oshawa via Woodbridge Parkway and Cherrywood". The advantages of this route were seen to be greatest use of the Parkway Belt concept, closest proximity to industrial and commercial areas requiring increased power, and as affecting the least amount of Southern Ontario agricultural and residential acreage. The Council also endorsed "... a North-South route connecting The Bruce Generation Station to a Guelph Transformer Station and from there connecting with the Halton Station via 401 Highway". The merits of this route were submitted as "... a more direct link up to the proposed high growth industrial area of Guelph"; as "...this city and surroundings will need more power than the low growth agricultural Georgetown area". Also this route was noted to use the existing transportation corridor of 401 Highway. The Council noted that "...the combination of these two routes makes greatest use of the utility corridor concept", and therefore recommended the endorsement of the Modified Q route.



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The Town of Georgetown Council recommended the adoption of basically System "R", using the 401 alignment. Their reasons for supporting this route were that "...it generally follows established and accessible routes", "is closer to the demand areas to be served by the system", "will have least impact on a smaller area of rural hinterland and the Escarpment", and, "the total length of Hydro line is significantly shorter than any other proposal".

The Town of Milton Council submitted a detailed report detailing impacts in the area of Milton in terms of the information items documented throughout the study and in terms of economic and social costs. The brief noted that the route should pass through areas of minimal land value and features, that lands on the southern or shortest routes are of good agricultural use, or due to access and services, have high development potential. It was submitted that the southern routes were close to existing or future urban areas, while the original Hydro route passes through lands intended by provincial planning to remain in their present development state. In the Milton area in particular, the 401 route was stated to adversely affect the present and proposed industrial park land uses on either side of Highway 25 north from Highway 401 up to No. 5 Side Road. The brief noted services are imminent to this area, and that the sterilization of these lands was felt to result in a financial burden being placed on area citizens as well as future assessment loss, job opportunities and loss of present potential. The brief recorded that a 401 route would adversely impact the heavily

utilized cultural and multiple use recreational facilities at Kelso Dam Conservation Area, and that a route between Rattlesnake Point and Mount Nemo and their respective conservation areas would destroy the scenic beauty of these valley lands. The Council considered this particularly important due to the recommendation that lands in this area be acquired, as stated in the Gertler Report. If a 401 route was selected, the effective route width would also have to include an additional width for widening Hwy. 401. Further it was noted that with present flight paths over Hwy. 401 at Milton, where the ceiling is low, a route does present a danger and possible hazard to navigation approaches. They expressed concern for the impact the lines and substations would have on developing areas of the Town, including residential, recreational and education areas, which were described in detail. It was further pointed out that Parkway belts have not been provided north of 401 in the Milton area and that this must be considered. It was noted that land values north and east of Milton, and in Brampton-Bramalea area are extremely high, and recommended that a complete financial analysis in this respect must be made.

In terms of natural resources it was recorded that the 401 route would affect a potential well site at the intersection of 6th line Nassagaweya and Highway 401. It was considered essential that minimal damage be caused to the ground water resources of the Milton Area. In terms of scenic quality, it was detailed that the installing of four lines of Hydro towers adjacent to Hwy. 401 and any high-



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way would be creating a maximum impact. Land elevation was suggested as not as important a consideration as avoiding centres of urban development, places of natural beauty, recreational facilities and major highways. It was noted that there appeared to have been very little information or data collected from the Town of Milton in respect to development plans and proposals, existing and planned facilities or existing environmental effects.

The brief recorded existing rail and highway facilities bounding and going through the town. It noted that if Hydro routes either to the north or south of Milton, in addition to a transformer station and a north-south line east of Milton were established, not to mention the Parkway Belt legislation, that "...this Municipality will have to be the most persecuted and unplanned community in Ontario despite the efforts at the local level to develop an orderly and well-planned community".

The brief recommended that a complete analysis be made of all factors and influences that will affect the quality of life -- economics and effective Hydro services to the people of this portion of Ontario. It recommended detailed and comprehensive cost analysis of the various routes, including construction and servicing, prior to a final decision being made and that this be made public. It requested that this analysis include the value of work completed and land acquisitions that would be redundant, if any route other than the original were selected. Another recommendation was that the location of transformer stations in

respect to actual and future load points be considered ; and noted that a station in the Streetsville area would better serve the growing Mississauga and Lakeshore area than a site on Milton's east boundary. It recommended that joint use of a major transmission facility for any distance with a gas pipeline be ruled out due to safety factors, tubular type towers be used wherever possible subject to engineering and economic constraints, minimum damage be done to natural resources, lot lines be utilized, fair market value plus forceful taking allowance be given to all properties acquired and, if the owner desires, the entire property be acquired where a route passes through the middle of it.

The Council concluded that "...without the full knowledge of all aspects, particularly engineering and economics", it recommended "...the adoption of the originally proposed route, and concurred that (they) must accept some inconvenience in the name of progress with regard to the north-south route to the east of Milton". The Council noted its support in essence for proposed systems S or T.

The Town of Oakville did not submit a brief. However a letter, dated August 16, was received from the Town, enclosing a Council resolution of August 13 stating that "...whereas it has recently become public knowledge that one of the proposals under review provides for a tower line to be constructed in the northern part of the Town", the Council requests the Solandt Commission "...to conduct a Public Meeting in the Town of Oakville

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in order that this proposed route can be reviewed". This correspondence was forwarded to the Solandt Commission.

### *Wellington County*

The Township of Eramosa recommended that the corridor should follow system Q in a public utility corridor along Highway 401. If the proposed route should enter the Township, the Council, with one exception, recommended that the route follow the original proposal. The Council noted their concern with proposed connection routes or substations, and stressed their opposition to any proposed substation in their Municipality.

A letter received from one Councillor reiterated opposition to any proposed substation, stressed local opposition to the original Hydro route, and added a further recommendation for a Modified Q route.

The Township of Erin Council suggested that a joint utility corridor could be formed, and that such a route should be as close as possible to areas requiring the greatest use. It stated that a route should be as short as possible. It recommended that "...such a route could be established west of Metro Toronto by following along the MacDonald Cartier Freeway (Highway 401) to a point south-easterly of Guelph, thence curve southerly toward Nanticoke. The north-south line to Douglas Point could intercept south of Guelph and be routed westerly between Guelph and Kitchener, these cities we feel have a great potential use in the future". The Council pointed out that this suggested

route would cross the Escarpment once, whereas other routes would require additional crossings, and that this point was significant due to provincial government concern to protect the Niagara Escarpment. It was stated that this recommendation was felt to have merit and "...that any entry into our municipality would be strongly opposed as it would not be in the best interest of the public".

### *Wentworth County*

The Township of East Flamborough Council stated in a resolution that it did "...unanimously endorse the submission of the residents of the said Township and request that Ontario Hydro follow the previously proposed route through Beverly Township where, we understood, the majority of the property has been acquired".

The Township of West Flamborough, by Council resolution, stated that the West Flamborough Council "...strongly objects to all alternate Ontario Hydro Transmission routes that cross the Township and request that the original route as proposed by Hydro be reconsidered, as Council feel that this proposed line interferes with less good agricultural land and fewer people, and we understood this right-of-way has been acquired, and therefore request the Commission to reconsider this route".

The County of Wentworth Council and Executive Committee passed a resolution endorsing the resolution of the Township of East Flamborough, as outlined above.

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# Response to Alternate Routes

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## Individuals

Following the Series III meetings, letters and briefs were received from 87 property owners throughout the study area. The majority of these letters came from private individuals, 81 in all, with 4 received from land development corporations, and 2 from aggregate producers. In total, 58 correspondents stated that they were affected by a proposed alignment. It was not possible to determine in numbers those whose property might be crossed, or those who were in the general vicinity of an alternative alignment.

The majority of correspondents were concerned with potential impacts on personal holdings, while several letters commented extensively on the regional aspects of an alignment. While 42 letters indicated no system preference, 4 recommended System T, 1 either System S or T, and 2 preferred R. System Q was recommended by 23 and 2 others specifically noted they preferred Modified Q. Of these two latter groups, all but a few referred to utilization of the Parkway Belt as an important aspect. A route through the Beverly Swamp was recommended by 8 individuals. Five persons favoured the original Hydro proposal.

Correspondents in most cases detailed potential impacts on agriculture, residences, and the natural environment in their immediate area. Some individuals recommended possible realignments and included detailed analyses.



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# Response to Alternate Routes

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## Groups and Associations

Briefs and petitions were received from 20 groups and associations in the study area. Of these, 15 were submitted by local residents and community groups, one by a local conservation group, two by county federations of agriculture, one by a provincial professional organization, and two represented province-wide environmental associations.

Many of these briefs included petitions and questionnaires. The petitions are specified in the following, while questionnaires were added to those received from other individuals as described earlier. As the comments received are again most detailed, the following is also intended only as a brief synopsis of the submission received.

### *Local Community Groups*

In the Markham Area, the Cedar Grove Community Club wrote to voice support for the most southerly route between Parkway and Cherrywood substations. Enclosing a petition signed by 33 members, they objected to all other alternatives "...on the basis that they bisect prime working agricultural lands and pass dangerously close to many residences and out buildings". Wherever possible alignment with existing Hydro rights-of-way was supported, and the investigation of SF<sub>6</sub> switchgear to reduce substation size.

Also in Markham, the Hillside Community Association requested that visual problems near this community not

be added to, particularly in the residential, conservation and buffer area proposed around the new Toronto zoo. They were opposed to a corridor along Steeles Avenue where "...resident agricultural activity still prospers", and asked that the additional facilities be incorporated into the existing Gatineau corridor. The Association also forwarded some thoughts on planning the new Pickering Community which included the reduction in size of the Cherrywood substation.

Several petitions and briefs were received from King Township area. A petition signed by 1,366 residents of King Township, recommended "...the adoption of System Q with the route passing directly from Halton to Woodbridge to Parkway. System Q was believed preferable as "...it is the most direct route, is consistent with the provincial plan for the Toronto-Centred Region plan, and it conforms to the proposed Parkway Belt", and it was felt that any other system would adversely affect the environment in which the petitioners had chosen to live.

The Pottageville Ratepayers Association brief included detailed comments on impacts of System T on the residential area of Pottageville, and on future development plans in this community.

It was recommended that the Hydro lines be placed "... along existing rights-of-way and through the power corridor planned for such a purpose, namely route Q".



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## Response to Alternate Routes

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From North Vaughan and Richmond Hill, a petition signed by 24 area residents, stated that "...the Kleinburg-Parkway link through North Vaughan and Richmond Hill would adversely affect our properties", and recommended "...System T or the Woodbridge Parkway link using the Parkway Corridor".

From Brampton, a petition including 14 signatures was submitted recommending the Modified Q system following the Parkway Belt.

A petition from the Terra Cotta area of north Chinguacousy Township, with 93 signatures, recommended that the proposed Ontario Hydro transmission corridor "...be located in the Parkway Belt, and not through scenic Niagara Escarpment lands near Georgetown and Glen Williams, and prime agricultural areas of Chinguacousy Township".

Several briefs were received from northern Halton County, particularly from those areas containing Niagara Escarpment lands.

The citizens of south Nassagaweya and Esquesing, residing adjacent to the north side of Highway 401 were represented in a detailed brief submitted by Reeve A. MacArthur which explained, with maps and photographs, the potential impacts on each property owner in this area. Thirty-four questionnaires from the affected property owners were also included in this representation. They suggested that a better route could be found, and that the original

route in Nassagaweya was good if it had followed lot lines in one location. They questioned why the Hydro line did not follow a utility corridor-parkway belt close to the urban areas which have to be supplied. An alternative in this area was also noted which would cross the Escarpment somewhat north of this area. It was further noted that a potential future widening of 401, if combined with the transmission corridor, would completely destroy the properties in this narrow strip.

In Nassagaweya Township, the Speyside Area Ratepayers Association brief gave detailed comments on construction and siting practices to be followed, favoured linear joint use corridors, noted incompatibility with woodlots and compatibility with agriculture, despite decreases in speculative value. Detailed comments were also submitted on the impact of a corridor and substation location on the Bruce Trail, scenic areas, residences, potential provincial recreation areas, and woodlands. The brief strongly objected to a routing through wooded lands in the area which were felt to have great potential economic value, and which are environmentally sensitive. It was noted that this area comprises "...one of the largest solidly wooded areas within your study area", and is also designated a restricted area within the boundaries of the Niagara Escarpment planning area. The Association recommended a Modified Q system, and if not acceptable, System Q.

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# Response to Alternate Routes

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The interested Citizens of North Halton and South Wellington submitted 2,560 questionnaires supporting a Modified Q system. This alternative evolved out of the Acton meeting and essentially eliminated the north-south link from Halton through the Georgetown-Acton area. Following the suggestion of the local people, B.H.I. Limited issued an Addendum to the other systems being discussed at the public meetings, stating that Modified Q would involve two crossings of the Niagara Escarpment -- one south of Rattlesnake Point and another along Highway 401.

The local citizens' group revised the B.H.I. questionnaire showing the following diagram and listing the following points endorsing and recommending Modified Q:

- " 1. The concept of a utility corridor/parkway belt recently announced by the provincial government is, in our opinion, in the best interest of all the people of Ontario. Modified Q more closely fits this concept. It is also the
2. Route which offers the greatest potential for multi-use, and places bulk carrier closest to where it is used. It is also
3. Considered to be the shortest route and least effect on acreage.

4. A significant portion of the land in this route follows Hydro right-of-ways, expressways, and much of the land is already owned or controlled by the provincial government, and therefore does not have to be assembled from private owners.
5. The route which provides the best environmental "fit" -- with less disruption of agricultural land.
6. The route "Modified Q" is, in my opinion, the best for the Province of Ontario and its citizens."

Subsequently local representatives met with B.H.I. and Ontario Hydro to discuss the reasons for the rejection of System R, one which also would have eliminated the need for a corridor through the Georgetown-Acton area.

As they are also directly affected by the corridor from the Bruce generating station to the Georgetown station, which is currently under study by Ontario Hydro, this local group has been investigating the system configuration outside of the B.H.I. study area.

Although it is beyond the terms of reference for this study, the group questions the need for two corridors from the Bruce generating station. They state that combining the lines into "...a single corridor to Kitchener and proceeding on to 401 and then following the Modified Q route" reduces the total length of corridors from 229 miles to 121 miles.

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# Response to Alternate Routes

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In north Burlington, the brief of the Kilbride and District Area Citizens recommended "...that the section of the transmission corridor from Middleport to Halton area in Beverly Township should run through the Beverly Swamp Area along the 401 Highway and Parkway Corridor east of Milton". This recommendation was passed by over 200 residents attending a meeting held July 16, 1973 at the Kilbride Public School, and supported by 229 questionnaires received with the brief. This recommendation was suggested as the route most acceptable above ground, with the least visual, residential, environmental, economic and agricultural impact; and with the highest public acceptance in the area. The submission explained in detail the impact of any proposed route through Kilbride and District on a minimum of 200 residences and the landscape and scenic area of Rattlesnake Point. It specified the affects on prime agricultural lands in this area, giving details of 23 agricultural operations. It noted the concern for the environment of residents in the area, who consider themselves conservationists, and that the Beverly Swamp area contains no homes, is unproductive and that "...the area west of the swamp is flat and generally unattractive with considerable scrubland". The lack of notification or awareness of earlier meetings was objected to by participants at the local meeting.

The East Flamborough Area Citizens Committee brief also stated its objective to obtain the best route from all standpoints. The brief reported that "any one of the proposed northern routes through East Flamborough would

directly affect a minimum of 100 homes plus many more in the Freelon-Campbellville area", and "...in the Lowville-Rattlesnake Point area". The scenic and diverse topography of the northern part of East Flamborough was outlined. It was noted that "most of the proposed routes "...are extremely close to concession roads", therefore heightening visual and residential impact. The presence and importance of productive farms in East Flamborough was recorded and they stressed that "there are no homes" or "productive farms in the Beverly Swamp"; and that "there are considerably fewer productive farms in an area west of the Beverly Swamp. The Beverly Swamp, although environmentally useful, is flat and generally unattractive", while the area west of the Swamp is "flat and featureless, in places, and with considerable scrubland". It was stressed that "the case for avoiding the Beverly Swamp had been overstated by a few environmentalists", and that "if constructed with due care, a transmission corridor would have no effect on the water table and be only minimally detrimental to wildlife". It was noted that many "conservationists who reside in the East Flamborough area are opposed to a route through the Halton Forest and Rattlesnake Point, and, indeed, anywhere through the Escarpment, except along Highway 401". There are "hundreds of residents in the area who consider themselves genuine conservationists" and "the fact that they own their properties in no way detracts from their overall concern for preservation of the environment".

Further, in discussing the consensus of the first question-



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## Response to Alternate Routes

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naire responses of joint use linear corridors, the brief stressed that "there are no major transmission corridors or highways in East Flamborough north of Carlisle" and that "Hydro has purchased land in the Beverly Swamp for its previously proposed transmission corridor". Property costs were detailed, noting that costs in "East Flamborough, north of Carlisle, are relatively high -- up to \$2000 an acre" while "property and land values in the area west of the Beverly Swamp are relatively low -- up to \$800 an acre". They indicated that "Hydro has purchased land in the Beverly Swamp for \$240 an acre". It was stated that there had been inadequate public participation in the study from this area, and that residents had not been advised nor were aware of earlier meetings. Having now learned of the proposals and wishing to make constructive comments, it was noted that the consultants considered public acceptance important. It was noted that a route could change if requested by people, and that the 780 individuals signing the enclosed petition were therefore requesting this.

The brief, therefore, recommended that "the section of the transmission corridor from Middleport to the Aberfoyle area should stay in Beverly Township and run a) through the Beverly Swamp, or b) along the fringes of the Beverly Swamp, or c) in an area west of the Beverly Swamp". A general review had also been made beyond this area, recommending that "the minimum impact route beyond Aberfoyle lies along the Highway 401 corridor, and through the Parkway north of Toronto".

A petition containing 140 signatures was received from the residents of the Mountsberg area in East Flamborough. It stated that this petition was restricted to this area as the land on or near Mountsberg Road would be affected by each of the alternate routes. It was submitted that "...the disruption of the lines and livelihoods of the people of Mountsberg will be repugnant to any responsible government". No recommendations were made as to the most appropriate route, and the petitions urged "...those knowledgeable to devise a route which will avoid the community formed, and still forming, in Mountsberg". It emphasized their "...unalterable opposition to all the routes impinging on Mountsberg", and noted the support of the petitioners for the petition circulated by the East Flamborough Area Citizen's Committee.

A petition, received from the West Flamborough Persons Opposing the B.H.I. Limited Proposals, contained 38 signatures and recommended the avoidance of scenic and agricultural areas, and a route through the Beverly Swamp.

### *Local Conservation Groups*

One brief was received from a local conservation group, the Students Park Fund: Save the Escarpment and Dundas Valley group of Dundas. This submission recommended System R or Q with the Halton-Woodbridge-Parkway option, as that one closest to cities and providing a greenbelt near Toronto. The importance of not traversing northern lands, and the advantages of System R following "...the highway in a rural area", thereby lessening impact on the landscape were noted.



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# Response to Alternate Routes

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## *Regional Agricultural Federations*

The Peel County Federation of Agriculture submissions stressed the incompatibility of Hydro corridors with Class 1 and 2 agricultural lands and recommended the use of "...the Parkway Corridor to support the necessary services of urban development, and that the Parkway be constructed to be compatible to the recreation requirements of urban people". This resolution was put to and approved by the persons attending the Series III meeting in Brampton. The brief detailed field enlargement programs, increasing use of large equipment, the economic importance of agriculture to the well-being of Ontario, and the provincial plans to designate long term agricultural areas.

The York County Federation of Agriculture submitted a resolution recommending "...that the proposed Hydro line, in crossing the region of York, be planned to cross roadways as nearly as close to 90 degrees as possible", and "that the line be kept at a reasonably safe distance from any airport". The brief noted that angles in the proposed routes crossing roadways at less than ninety degrees on farmlands lessen the value of farm and home frontage, and of farm property. It was felt that one of the proposed routes passed "...dangerously close to Buttonville airport which proposes to expand in the future to accommodate jet aircraft". A brief was also received from the Chairman of the Property Committee of this Federation. It was noted that the basic system Q appeared best but that a connection through Kleinburg would perhaps be best

to avoid problems with Toronto International Airport. Primarily concerned with the effect of a proposed route on farmers, this brief gave detailed suggestions for diversions in Markham, Richmond Hill, and Victoria Square.

## *Provincial Business Associations*

One brief was received from a provincial business association, The Aggregate Producers Association of Ontario. The importance of inground mineral resources as an important and diminishing environmental feature was stressed, and impacts on aggregate properties noted. The submission recommended that the corridor be placed in the provincially legislated green belt and service corridor as in proposal Q.

## *Provincial Environmental Associations*

Two submissions were received from provincial environmental associations, which considered in depth the regional implications of the proposed alternative alignments.

The Federation of Ontario Naturalists is a province-wide organization with a particular interest in the complex social significance of natural and semi-natural areas, wildlife, and aesthetics. In reviewing the alternatives, the Federation was concerned with "...the maintenance of biologically "healthy" and diverse communities scattered throughout the landscape", natural land uses which were stated to be the most difficult to establish over time, and many which, if lost, cannot be replaced. The Federation also considered it important to avoid disruption of

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## Response to Alternate Routes

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communities, farmers, and individual residences, and to minimize any impacts wherever possible. In addition, the group's review included consideration of the "...types of operation, and the degree of land use impairment which would arise from corridor location".

The Federation strongly stressed "...that a very careful re-examination of the basic system design is what is really needed".

It was noted that Federation representatives examined all the alternative proposals "...on topographic maps, on air photographs, by car, and -- so far as possible -- on foot".

The brief summarized criteria used in reviewing alignments which are listed as follows: The Federation "...sought lines which a) utilize existing and future corridors, b) provide benefits, particularly in the form of green space, to urban centres, c) utilize minimal impact areas, including orchards, nurseries, small farm operations, pasture, and so forth, d) utilize maximally impacted areas, including gravel pits, railway lines, and cleared land, e) utilize land use edges, and f) would be the shortest".

The Federation also "...sought lines which would avoid: a) impacting as many biologically significant natural and semi-natural areas... b) severely impacting certain most sensitive land operations, c) maximal line-based expos-

ures for those seeking pastoral settings, d) permanently disrupting aesthetics, e) rugged land and hence high large-visible areas, f) large numbers of structures, g) fixed, detrimental impacts for other planning regions".

The summary noted that the Federation "...recommended an imperative re-examination of the basic system and system design procedure".

The Federation recommended "...a southern routing, similar to, but differing in important respects from Modified Q..." It recorded that "...the northern routings could only be viewed as tragedies, with the northern alternative crossings of the Escarpment involving "...a considerably greater impacted area", and adversely affecting the quality of the overall regional unit. It was stressed that "...headwater streams are the most sensitive biological areas in a watershed"; and that in addition the Federation considers "...it absolutely imperative to maintain existing contiguous natural areas..."

The submission stated that the Federation's preferred route has the following advantages: a) "the only routing which closely approaches the concept of a utility corridor..." b) "dissects the least amount of intact forested agricultural and other land use units..." c) is the "shortest -- least area affected -- least generation requirements", d) "provides the greatest potential contribution to urbanized communities, e) minimizes impact on natural and rural areas, f) best fits the landscape by following por-

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## Response to Alternate Routes

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tions of disturbed landscapes, and of existing utility and highway routes g) much of the land is already assembled frozen...", h) "has the least effect on high-quality aesthetics and i) has the best system design..."

The Federation stated its acceptance of the Modified Q system "...with one major exception and three comparatively minor route modifications..." (The system recommended and illustrated in the Brief is in essence System R, involving one crossing of the Escarpment near Highway 401).

In this regard the Federation brief recorded its objection to an Escarpment crossing in the Rattlesnake Point area. It was recorded that such a route would "severely disrupt designated land uses, ...degrade the character of the area...", "impact an important and sensitive biological area", and "...seriously affect farming in one of the richest and most important agricultural areas in Ontario". From the standpoint of regional planning, this alternative was viewed as "...a fundamental and objectionable form of further dissection of the area". The Federation stressed that this entire unit should "...be maintained as an agricultural, wildlife support, and recreational matrix", and their strong belief that a single Escarpment crossing, along the existing 401 utility corridor was necessary.

To overcome objections to a 401 crossing, the Federation recommended a realignment of the proposed transmission corridor in this area, as well as the use of low profile

towers, "cosmetics" in landscape management, and "...a concerted, combined effort by Ontario Hydro and the Ministry of Transportation and Communications" to screen the area. The slight northerly realignment proposed was felt to avoid disruption of the residents, and in particular farmers directly north of Highway 401. The brief noted that "...the sections of the corridor which will be visible from below the Escarpment have already undergone sever disruption; this pocket contains gravel pits, two major quarries (one south of 401), several dams, and the existing utility corridor with Highway 401, and the CP rail line". The submission noted the Federation's belief that the visual impact of a joint corridor can be acceptable, as motorists "...when exiting from 401, leave the corridor into truly scenic and only slightly altered landscape". For the motorist, it was submitted that "...low profile towers and thoughtful right-of-way management will greatly reduce the unpleasantness of the view". From a hiker's viewpoint, "...the combination of longitudinal utility features into a single corridor must be viewed as desirable".

In the eastern portion of the study area the Federation brief also recommended two small realignments to avoid an important natural area and wildlife refuge northwest of Victoria Square, and an important woodlot near Cherrywood.

The Sierra Club of Ontario recorded that its analysis of alternative alignments concentrated on three related as-



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## Response to Alternate Routes

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pects of transmission line planning: "aesthetic impact, the possible degradation of landscape quality -- impact on the natural environment, -- impact on park and open space provision". It was noted that a basis for the brief was the belief that "...in most cases the transmission lines would have a low impact on agricultural land, compared to other rural land uses". This was felt to be the case because in farming "...the existing land use can continue with only a marginal impairment of productivity..." The brief recorded that this was "...just the opposite with woodlands -- their value to society is virtually destroyed if they are crossed by transmission lines..."

The Sierra Club stated its conclusions as follows: "A Q route would be generally acceptable except for a few weaknesses, some of which might be eliminated. A T route would be undesirable because of its high impact on all three concerns".

The submission recorded that in a detailed analysis route T was felt to have "...the most serious weaknesses". It was noted in particular that several sections of route T go through areas....where there is a harmony between man and nature". The brief stressed that "...it is important to retain these areas where progress has not yet destroyed this balance, in order that we may learn from this setting". An example of one such area was given, where a "...section of the line cuts through part of the Oak Ridges Moraine, an area where it would be impossible not to damage the scenery, or to cut through ecologi-

cally sensitive areas". The Niagara Escarpment crossing in System T was recorded to have several disadvantages, -- the longer line, and intrusion of the lines into the area north of Highway 401 and west of the Escarpment. It was noted "...that parts of this area have a special quality, a settled charm, that results from a combination of the rolling topography, the mixture of forests and fields, and especially the beautiful stone houses".

Comparing Systems S and Q, the Club preferred System Q, which was felt to have the advantages of providing open spaces where it passed through urbanizing areas. Great concern was expressed for impacts on the Meadowvale and Claireville Conservation Areas. These were considered the only drawbacks of this route in open space provisions. The brief noted that System S "...would cut through a number of interesting and attractive areas, especially between Kleinburg and Richmond Hill. As well there would be a number of unsatisfactory river crossings on the headwaters of the Humber".

In assessing the Niagara Escarpment crossing, the Sierra Club stated that "...doubts still linger as to the necessity of having two Escarpment crossings". The group felt that the most desirable location would be adjacent to Highway 401, tying into a Q system, if only one crossing was to be made. They noted the difficulty of even assessing this, "...because such a decision is mainly a question of aesthetics and insufficient material is available to ascertain exactly what the visual impact would be".



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# Response to Alternate Routes

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Evaluating this area assuming that two crossings of the Escarpment are required, the Club submitted that "... considering it in isolation route Q would be superior to Modified Q, because Q has only one crossing of the Escarpment in a high visibility area. Modified Q would necessitate a line south of Rattlesnake Point, and this would significantly disturb the existing pastoral landscape".

The Sierra Club stressed that "... it is not desirable to make a decision on these types of considerations alone". The group recorded that information was required on the comparative environmental implications of alternative tie ons from the Bruce Generating Station, either via Georgetown, or a Guelph Transformer Station. The Club concluded that "... until such time as this information is available, it is not possible to make a firm recommendation concerning the relative desirability of Q versus Modified Q".

The Sierra Club recorded, "... in summary, Q would appear to be the best alignment, with the Niagara Escarpment crossings a major drawback. In this regard, further information must be available before the relative merits of the Escarpment crossings in System Q can be determined. Information is also necessary concerning the implications of choosing between Georgetown Transformer Station and Guelph Transformer Station. When further data are available it is possible that System S could prove to be reasonably satisfactory, if a number of modifications are made. Route T appears to be clearly the least desirable of the three routes".

## Questionnaires

The second questionnaire was distributed during the Series II regional meetings, to the mailing list, and in response to requests following Series III. Respondents were asked to indicate a preferred system and alignment, note associated problems, suggest any preferred diviations, and list any further comments. Diagrams of alternative systems and a map of the study area illustrating the proposed alternative routes were distributed with the questionnaire.

At the Series III meeting in Acton on July 6, an alternative system, designated "Modified System Q", was proposed by the public. A diagram and description of this new alternative system was then prepared and distributed with the other material at all further meetings.

In total, approximately 8,000 questionnaires were distributed. Three thousand of these were bulk mailings to groups requesting additional copies after the meetings. It was also evident from the returns that many individuals and groups had xeroxed copies of the questionnaire to distribute. In particular, the Interested Citizens of North Halton and South Wellington reproduced the B.H.I. Limited questionnaire, incorporating a diagram and reasons for supporting a Modified Q system.

In Appendix IX, the questionnaire replies are grouped by County, and by the places of address given by respondents from each County. The number of individuals who

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## Response to Alternate Routes

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stated that they were directly affected by an alternative alignment is also indicated. As evident from the questionnaires, this number includes both those whose personal holdings were possibly affected, and those residing in the vicinity of an alternative alignment.

The table also lists the system preferences given by individuals from each area. In addition to Systems Q,R,S, and T, one specific local preference is shown -- west of Highway 6, through Beverly Swamp, and along 401. This was done in order to reflect the views from a large body of questionnaires received from Wentworth and Halton County which stated this recommendation, but gave no preference outside of this immediate area.

Of the 4,044 questionnaires returned, 2,672 favoured a modified Q route. This recommendation came mainly from residents of north Halton and south Wellington Counties. A Q system was favoured by 805 respondents, mainly from north York Regional Municipality, and from Halton and Peel Counties. The great majority of these favoured an alignment following the Parkway Belt. Under ten respondents favoured a link to Kleinburg, while the remainder did not note either alternative. A route proceeding west of Highway 6, through or adjacent to the west edge of Beverly Swamp and then north to Highway 401, was recommended by 412 individuals, mainly residing in Wentworth County and Halton County. A small number of respondents indicated preference for each of Systems R, S, and T.

Of the total number of questionnaires received, only 45 did not state any system preference. These particular responses were included in the area tabulations as many indicated that they were directly affected.

# System Planning

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During the course of any transmission line study the real need for new lines is eventually questioned. Indeed, in the United States in cases where routes must be certified by some state agencies, not only must the utility demonstrate the electrical need for the line but it must also indicate what alternatives are available, not only for routing the proposed line, but in securing power from other sources. For the most part these issues were settled by the Solandt Commission in the Interim Report. The need for the lines was clearly established, and no alternative sources of electricity were available. In fact, the very purpose of the proposed lines is to link several generating sources with load centres throughout the Province.

Even with the need clearly established however, some of the system details were not. After the study began, it was found that all five lines would not be required in every instance -- it depended where the corridor was located. It was also found that all lines were not required immediately. Some would be needed in the 1980's and later.

As the study progressed, more information was provided on the three connections required to the north, at least one of which was found to require an even wider right-of-way than the Middleport-Pickering corridor. The need for substations was also documented more explicitly and it was found that between four and six of these could be required, ranging in size from 100 acres to one-third square mile, depending on the site and the type of substation design chosen. It was also found that the location

of substations presented very definite problems, equal or greater than the lines themselves. Because of the weight of substation equipment for example, it is necessary to be reasonably close to a railroad but away from Provincial Highways, for Hydro is not permitted to cross them with such heavy equipment.

Securing this information took time. It was not all supplied voluntarily at the outset in full and complete form as we had expected it might, particularly in view of the extensive documentation Hydro must have prepared for last summer's Solandt Commission hearings. The problem may have been associated with the technical complexities of system planning, for it became necessary to enter into a series of questions and counter questions in order to secure as thorough an understanding of the problem as possible. Even now however, there are probably some 230 kV lines that Hydro will require in the future that are not part of the Middleport-Pickering or northerly corridors which will require future study by Hydro and approval by the Government.

The basic concept behind the electrical system which is being planned by Ontario Hydro is simple. Throughout the Province, a number of generating stations located on the Great Lakes, must be interconnected by a network of 500 kV corridors. These 500 kV lines connect to substations, located near the major load centres, where power is transformed into a 230 kV system which then

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# System Planning

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connects to numerous local transformer stations within the urban areas. From these stations, the power is then distributed to local users.

In the past, each of the elements of the total system could be planned and built in isolation of one another. Each had its own criteria governing location. For example, the primary considerations in finding generation sites have been sources of fuel, and access to large water bodies for cooling. High voltage transmission lines had very few alignment controls other than the points which they joined. Today, the process is somewhat more complicated. People are more aware of the importance of physical environment and have introduced new constraints on the way it is affected. Increased public concern, as well as the need for more and larger generation sites, transmission corridors and transformer sites has changed the process of planning and development. One element of the total system cannot be located in isolation of the others. All are interdependent. The physical and social environment must be incorporated in the early planning stages to help interrelate all elements of the total electrical system, hopefully resulting in a total plan with the minimum impact on the environment.

The basic concept of the electrical generation and distribution system is quite simple. Its planning and design are not. Details of numbers of circuits, voltages, transformer and switching stations, security aspects, and time phasing are very complex. Ontario Hydro provided

diagrams which illustrated four alternate configurations for the Middleport-Pickering corridor and the connections to it from the north. These conceptual diagrams indicated: (1) the number and type of 500 and 230 kV lines required; (2) right-of-way widths; (3) transformer stations; and (4) an estimate of the in-service year for each line. In some cases the actual need for the 230 kV lines was not known. At the time these diagrams were presented, it was also stated by Hydro that "there are of course many more arrangements which are theoretically possible".\*

In applying these alternate systems to the environmental inventories of the region, it was found that all systems required at least two crossings of the Niagara Escarpment. In order to reduce the impact on the Escarpment by having only one crossing point, a system "R" was developed which involved a variation of one of the Hydro alternates. Initially, Ontario Hydro conceded the possibility of this system, and expanded a related study they had underway for the Bradley-Georgetown line. Later, however, after further investigation, Hydro revealed that such a system configuration represented a high security risk in placing lines from two generation stations--Nanticoke and Bruce -- in one right-of-way across the

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\* Correspondence from Mr. K.R. McClymont, Manager, Transmission System Planning, Ontario Hydro, March 16, 1973, Ontario Hydro File No. 500.014.151.



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# System Planning

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Escarpment; this risk to electrical system reliability Hydro deemed unacceptable. Alternate system "R" was developed in keeping with Hydro's note that other "arrangements are theoretically possible". The one which was developed to satisfy an environmental issue, however, was found to be unsatisfactory electrically. The result of the system "R" study indicates the type of interaction required between systems engineers, environmental planners, and right-of-way personnel in order to find optimum corridors which are both electrically feasible and environmentally sound.

Systems planning should not continue out of context with the physical environment. Before any facilities are planned, a broad scale study of the region which may be potentially affected should be undertaken. From such an investigation it should be possible to determine the major landscape influences and social patterns of urban and rural development which would delineate areas of potentially high impact. Such a study, of course, is not the total responsibility of Ontario Hydro, but should be conducted with the assistance and co-operation of other agencies of the Provincial Government having an interest in the future of Ontario's development.

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# Land Acquisition

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Many farmers and farm organizations were apprehensive that the 610 foot right-of-way proposed by Hydro would impact farm operations to such a degree that for some farmers at least, farming would no longer be economically feasible.

Certainly a transmission line corridor will, to some degree, impair the normal operation of a farm. While most of the right-of-way would still be available for agricultural purposes, structures, guy wires, and other impediments will restrict movement. Agricultural groups have noted that this is a significant problem where broad-beamed equipment is being used, as is becoming more prevalent in prime agricultural areas. On less productive lands where field consolidation and intensive mechanization is not as common, these impediments may not be considered as important.

Hydro's present purchase and lease-back arrangement allow the farmer to be paid in full for the right-of-way, yet he may continue to farm the land at a cost of only one dollar per acre per year, plus agricultural rate taxes. Yet the farmer's concerns must be recognized and appropriate measures taken to alleviate the problems which may occur.

When it appears clear that there are farmers who would be forced to operate uneconomically due to the extreme width of the right-of-way, arrangements should be made to purchase the farm outright and sell the land to abutting

or adjacent land owners who may seek a larger land area for their farming activities. Such instances should be few, applying principally to operations where the extreme competitive nature of farming would in time likely force the farmer out of business as a natural course of events. Decisions on farms requiring this approach should be made only on the basis of a careful appraisal of each individual situation and Hydro should rely on the knowledge and experience of the Provincial Ministry of Agriculture and Food for guidance in each case. Farm size, soil quality and the economic health of affected farms can provide a starting point to determine whether it is necessary -- or desirable -- to purchase a farm outright.

A point raised by some farmers was that procedures should be set up to pay compensation to farmers whose crops are damaged when Hydro traverses their right-of-way for repair or other purposes. This suggestion should also be considered by Hydro.

## Compensation for Visual Impact

The influence of a transmission line does not stop at the boundary. Visual impact is undoubtedly the most significant influence felt beyond the right-of-way and many people contend the visual presence of the lines depresses their property values, even if they are some distance away. Whether this is true in fact is difficult to prove, particularly in rural areas. Some studies indicate that in suburban subdivisions, the prices of homes which back on a transmission right-of-way are often similar to those

# Land Acquisition

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not so located. Some people even prefer to back on the right-of-way for the added open space it provides despite the visual impact of towers. In these cases however, it is the homes that come after the line is already built, for new transmission facilities seldom require routing through existing built-up housing areas.

Yet the point is valid. Putting the lines underground -- assuming it were technically and economically feasible -- would remove most of the objections to visual impact. Overhead towers can be seen, and their size in relation to the common objects of the landscape -- trees, homes, farms, and other man-made objects -- represents an intrusion.

Whether this intrusion warrants financial compensation by Hydro is a much more difficult issue. The right-of-way itself must be bought and paid for, but whether the homeowner across the road requires payment because his view is impaired is questionable under current laws, despite the justice of the claim. Indeed, if compensation were to be paid for, the visual impact of transmission towers perhaps it should also be required for a new highway, a new railroad line, perhaps even a new high rise apartment, suburban subdivision or industrial complex. All would impair the view to some degree.

This is not a question that can be answered satisfactorily within the terms of reference of this study. The issue was clearly stated during the course of our open planning

program, but the answer would seem to lie in a governmental study of compensation practices on a much broader basis.

The same is true of agricultural problems. While Hydro lines can and do impact agricultural operations, these lands are lost forever when urbanization occurs. Under Hydro lines agriculture can continue, even if modified.

The problem of retaining agricultural lands for the future is not one solveable by Hydro alone. It requires broader study of all the impacts which diminish scarce and productive agricultural lands.



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# Transmission Towers and Substations

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To most people, it is the transmission towers and substations that represent a Hydro line. They can be seen, and even if other environmental problems may be just as significant, the visual aspect looms largest in people's minds.

To provide some insight from the public standpoint, two citizen study committees were formed during March, charged to look into ways of reducing the environmental impact -- including the visual impact -- of tower lines and substations. Hydro provided technical assistance to both groups.

Many meetings were held by the committees and discussion was often lively, particularly with Hydro staff who had the difficult task of trying to match the aspirations of the citizens with the practicalities of current technology and engineering capability. Nonetheless the meetings proved fruitful, for both sides.

## Towers

The Citizens Committee on Tower Design met eight times and while concerned with non-visual environmental problems, soon focused on the design of structures as the primary issue. Considerable time was spent in studying different types of towers, both lattice and "improved appearance". Many designs were prepared by Hydro for Committee review and a final group of four was selected for study in different background settings. A set of photo "montages" was prepared showing the four tower designs

against different suburban and rural backgrounds. Some of the montages prepared for the Committee are reproduced in this report. The full report of the Committee can be obtained at the Solandt Commission offices.

In summary, although not always unanimously, the Citizens Committee on Tower Design recommended that:

- (1) Two 500 kV circuits be carried on one double circuit tower rather than two single circuit towers. A double circuit tower, although higher, would require less right-of-way than two single circuit towers.\*
- (2) Structures should be "improved appearance" tubular towers rather than lattice, and these structures should be used everywhere. Hydro representatives felt the cost of using tubular towers throughout would be excessive.
- (3) A single tubular upright design was preferred, providing cost, reliability and other factors are equal with a double tubular upright design. (No single tubular design was prepared on mon-

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\* A single circuit tower carries three wires on one structure. A double circuit tower carries six wires on one structure.



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# Transmission Towers and Substations

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tages, although this is the preferred Committee design. A double tubular upright is shown on some montages.)

- (4) Conductors (wires) should be arranged vertically, three on each side of the towers with the middle wire offset.
- (5) Crossarms should be horizontal or up-swept.
- (6) Where tubular towers cannot be used, a lattice type with the same basic configuration should be used.
- (7) Tower colour should be varied to suit the background. In woodlots, "weathering steel" is acceptable.

In reaching its conclusions, the Committee stressed that because appearance affects most people, it was given first and greatest attention. Minimizing the height of towers was not given priority over all other factors because even the shortest design would be tall enough to be seen in many places. Because the number of towers visible at one time was considered to be important, this factor influenced the Committee in deciding whether single or double circuit structures should be used.

Because conductors (wires) have to go from tower to tower, it was felt desirable to have the same pattern of

conductors on each tower no matter what type of structure is chosen. Otherwise, a transition structure would be needed between towers of different design.

Weight is related to cost and lattice structures, because they weigh less, cost less than tubular designs. Tubular towers also require more concrete than lattice structures and require cranes to erect them. Although environmental disturbance will occur to lands during construction, the Committee felt that Hydro's control over contractors would be the main factor in minimizing impacts.

Except in very sensitive environmental areas, the Committee felt that construction disturbance can be healed by proper practice. Maintenance and tree trimming occur throughout the life of the project however, and access for trimming and maintenance should be by existing roads and farm lanes where possible.

## Substations

The Citizens Committee on Substation Design had fewer members and met less often than the Citizens Committee on Tower Design, yet prepared another set of excellent recommendations.

The Citizens Committee on Substation Design felt that the impact of substations could be reduced by: (1) having fewer stations; (2) reducing station size; (3) utilizing existing topography in siting; (4) "cosmetic" effects in landscape treatment and screening.

# Transmission Towers and Substations



# Transmission Towers and Substations

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# Transmission Towers and Substations

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While the number of stations was outside the Committee's concern, the Committee felt that the size of stations can be reduced by 80 to 90 percent by using SF<sub>6</sub> switchgear. (At present however, this type of switchgear is available only to 70 percent of Hydro's required short circuit current capability.)

In addition to substantially reducing station size, SF<sub>6</sub> equipment would allow wires to exit some distance from the station underground, thereby reducing the jumble of towers approaching the station from four directions.

Specifically, the Committee recommended that Hydro immediately order and test, either by itself or with other utilities, a set of SF<sub>6</sub> switchgear and underground conductors having the highest available short circuit capability, and that Hydro actively support development of new SF<sub>6</sub> gear to meet its requirements. The Committee also recommended that stations be designed to occupy the minimum space possible with conventional switchgear and that SF<sub>6</sub> equipment, once proven, be used for any additional circuits.

By following existing topography wherever possible, the Committee felt that substations could be hidden from view. The choice of a high profile (higher structures, less land area) or a low profile (lower structures, more spread out) substation design should be based on existing topography and the opportunity for screening.

Site screening of substations was considered to be quite important and the Committee recommended that vegetation -- predominantly evergreens wherever soil conditions permit -- be planted immediately after site finalization and long before installation of hardware. The Committee also felt that Hydro should start immediately to identify sources of large trees and reserve them for later transfer to station sites, once site plans are set. Hydro's need for trees should be integrated with other Government agency programs, such as the Department of Lands and Forests, and provisions should be made in station site plans for public recreation, consistent with the desires of the community in which the station is to be located.





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# Environmental Impact

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A word should be said about environment and environmental impact, particularly as these terms relate to this study.

The "environment" has no clear and exact definition. Over the past few years, the "environment" has become a general purpose term applicable to almost all natural aspects of the earth, including air, water, land, vegetation, and wildlife. It has also been applied to aspects of human life, such as the "living environment" or the "working environment". The generality of the term reflects an expanding awareness of the adverse changes that a technological society can bring to the very processes of life, from pesticides to air pollution, strip mining to mercury poisoning.

Most concern has focused on the changes or "impacts" brought about by man which will disturb, impair or destroy natural resources. Typically, these impacts are considered as single occurrences and consequently corrective efforts take the form of separate laws, regulations, and enforcement procedures for each specific problem.

In actual fact, however, the natural environment is a very complex system -- a highly interrelated structure in a state of dynamic equilibrium. If man did not exist, all other aspects of the natural environment would still remain, constantly changing over time.

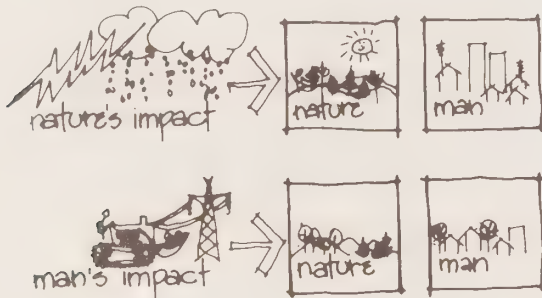
Today, this heightened awareness of nature places man as an intruder in the natural environment and there is a justified fear that exploding world populations, all reaching to become technological societies, could destroy the very basis of existence.

A new transmission line, whose impact is comparatively small in comparison with the many other impacts of man on nature, nonetheless is thought by many to be an undesirable intrusion. The ever growing electric power demands which those lines represent are met with a sense of unease by many people. Must the entire present capacity of an electrical system be doubled in the next ten years as load forecasts predict? And must that capacity again be doubled in the decade following? If the past is an accurate prediction of the future, then indeed this will be the case.

The question has direct relevance to the problem at hand, for if the forecasts are correct, the implication is that more, larger transmission lines could be needed in the future. To be sure, some of these needs are included in this study, but there are others which will undoubtedly arise as growth continues and power demands continue upward.

# Environmental Impact

In a very gross sense, the interrelationships between man and the natural environment can be diagrammed in a simplistic way. The diagram below indicates the relationship between the environment and the impacts it receives. The environment is broken into two components: nature -- comprising land, air, water, vegetation and wildlife; and man -- comprising the homes, businesses, industries, roads and other artifacts of living that man has created for his own benefit.



The environment is in constant change through the impacts of both man and nature. First, nature impacts itself by natural processes, most of which are so slow as to be unnoticed. Other impacts such as forest fires, floods or landslides are more dramatic. These changes occur for the most part independent of man's actions. Second, nature can also impact man's activities through rain, hail, flood, fire and other natural events. To exist, man builds to protect himself and his works from these natural environmental impacts.

Similarly, in viewing the lower half of the diagram, it can be seen that man also creates impacts, first on nature, by building structures and modifying the landscape, thereby changing or destroying some of the natural environment; and by discharging wastes which pollute the water, air and land along with the living things which inhabit these spheres -- including man himself. Man's actions also impact himself and his fellows, as for example when cities grow and require changes in living habits or when highways and subways are built, causing shifts in residential and commercial growth and modifications in lifestyle and travel patterns. This impact can be dramatically demonstrated by asking how different the greater Toronto region might be if the Yonge and Bloor subways had never been built and no highway improvements had occurred.

What this oversimplified diagram is intended to portray is that the environment is not a series of discrete, independent, unrelated cycles, but a dynamic mesh of man and nature in a constant state of flux.

There is no technique, no composite model, no method available at present for understanding this most elaborate and complex of systems. There may never be. But the diagram does aid in helping to ask the right questions and therefore has been used in setting out those aspects of the environment that should be considered in locating a transmission line corridor.

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# Environmental Impact

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## Assessing Environmental Impact

Typically, the approach to environmental impact assessment is on a case-by-case basis. A project is proposed, the impact is identified, the project is modified if impacts are found to be too great and then approval is given. This approach, while quite practical at the site scale, may win battles but lose wars, for the composite impact of all projects in total is not addressed. An additional ingredient is needed. That ingredient is an environmental inventory of significant resources within a region, followed by an analysis of what degree of change can be sustained without significant adverse impact. In essence, all areas are given a rank or rating varying from 'no change allowed', all the way to almost "any form of development permitted". In its simplest form this could mean restricting almost all forms of development within sensitive key areas, to no environmental constraints on vacant non-agricultural sites adjacent to built-up areas (in keeping with municipal official or Provincial plan objectives).

A case in point is agricultural land. Farmers have clearly indicated that good farmland is scarce and is subject to many intrusions, including Hydro lines. If indeed agricultural land is precious, then there should be constraints on its conversion to other uses. Here, there is a difference between outright change to urban use, in contrast to the location of a Hydro line over agricultural land under which agriculture can continue, even if at diminished efficiency.

All environmentally significant areas should be similarly identified and general standards set as to the amount or degree of change that would be acceptable without undue environmental damage. The problem of siting a transmission line -- or other new land uses -- could be made immeasurably easier and much less contentious if all areas were inventoried, labeled and ranked in terms of their relative environmental importance and the degree and type of impact they can sustain.

# Environmental Impact

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# Future Steps

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## Utility Planning and the Public

Long range planning is common in the electric utility industry. Increases in demand are fairly predictable and the need for new generating stations and transmission lines can be forecast many years into the future. Hydro's



recently announced expansion is a case in point, providing an excellent example of foresighted planning to meet Ontario's future electric needs.

Inevitably, there will be problems in translating these requirements into fact. Areas will be affected, environmental impacts will occur, people will be concerned. But because there is a long time span available between the initial planning step and reality, the process of translating the need into actual facilities should begin as soon as possible after the projected requirements are announced.

When announced, plans should include maps to indicate the general location of proposed future facilities so that the public will have some advance knowledge of areas that may be affected. Notice should be given to government agencies and the public indicating that planning for the announced facilities is about to begin and that the planning will be undertaken in co-operation with all concerned. Plans should be updated annually with progress reports on steps taken to plan co-operatively over the past year.

In the case of bulk transmission lines, the need is often known ten to twenty years in advance. It would seem appropriate therefore, that as soon as the need is identified for a line, Hydro could select a broad area within which the line will fall and inform all governments and their agencies of the intent to construct the line some years in the future. The public could be informed at the outset

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# Future Steps

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through the press and public meetings.

These steps would serve two purposes: first to inform people very far in advance; and second, to obtain information from all agencies, governments and the public on areas that should be avoided in selecting an alignment. As the planning process continues, the selection, presentation and discussion of alternative routes would occur, followed by the selection of the best one. Normal acquisition and construction would then follow.

This procedure is not new. It is followed in the U.K. and is being discussed and followed in some areas of the U.S. In light of current widespread concern in Ontario it may be fruitful to consider its application within the Province.

## Siting Criteria

At the moment, there are no governmental planning guidelines for Hydro to follow in locating their facilities. There should be. There are active and detailed municipal, regional, and Provincial planning programs in effect, many of which will directly influence the appropriate location of transmission lines. The Parkway Belt is a case in point. Yet even in the Parkway proposal, while space was provided for utilities, it was unclear in its designation whether it was sufficiently wide to accommodate the Middleport-Pickering corridor.

And there are other plans, both municipal and Provincial which can drastically affect the future location of trans-

mission facilities. Some means should be found for co-ordinating these plans -- as they develop -- so that long range needs for electricity can be co-ordinated with long range plans for development.

Through co-ordinated planning, it should be possible to designate areas that are to be excluded from consideration for future transmission lines. It would also be possible to designate broad areas where transmission facilities would have the least effect, within which detailed planning could then proceed.

Even where such plans are absent, guidelines concerning appropriate transmission line location criteria should be developed, preferably by Hydro in co-operation with other Provincial agencies. These guidelines could cover aspects of the natural environment -- what areas to avoid; how to cross streams or rivers; how to avoid visual impacts, and many others. In more actively developing areas, such as the area around Metropolitan Toronto, guidelines should relate to the effect of proposed transmission lines on growth patterns. Guidelines such as these have been adopted by the Federal Power Commission in the U.S. for the guidance of electric utilities and a similar approach should be explored in Canada.

## Public Participation

In an era of heightened environmental concern, there is a need to involve the public as planning for transmission lines proceed. The best means for achieving this objec-

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# Future Steps

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tive are still evolving however, and the experience gained in this study, while useful, indicates that improvements can still be made. One of these would be to allow more time. It is not possible to actively involve a large population in a complex siting problem in a matter of a few months. Starting earlier, in step with long range electrical planning, should be much more effective. Public participation can only be effective however, if the public is kept informed regularly, in order to maintain the momentum of the process.

How best to inform people -- by press, public meetings, mailings, television or a combination of all means -- will depend on particular circumstances. Hydro has already begun to involve people in siting studies for other lines and are to be commended for their outstanding efforts.

## Impact Statements

At present, Hydro is not required to prepare studies, reports or environmental impact statements when proposing a site for a transmission line. Whether such statements should be required is a governmental decision. Yet there is value in such a report, required or not. The procedures, analysis and conclusion reached in selecting a transmission route would be fully documented for all to see. It could be demonstrated that route selection is not arbitrary, but is based on sound engineering and cost requirements, on the avoidance of significant environmental impact, and on public and governmental participation in the process.

The comments of provincial, regional, and local government agencies could greatly assist Hydro in the application of location criteria to a proposed alignment. Procedures should be considered to establish the review of siting goals and construction practices, as applied to proposed alignments, by those government agencies whose jurisdictions involve the planning of the physical and man-made environment.

## Research

It was not uncommon for people at public meetings to point out that while man could go to the moon, he was not able to put transmission lines underground. There appears to be little doubt that if this were possible a good deal of opposition would disappear. Even with present technological problems and high costs, many people felt it worthwhile to underground and many appeared to be willing to bear the costs.

Not all the lines required for the Middleport-Pickering corridor are required in this decade. Several are required in the 1980's. It would seem, therefore, that every effort should be made to expedite research to bring lower cost underground transmission into the realm of technological and economic feasibility particularly for lines required in the next decade. There is an understandable reluctance by Hydro to resort to higher cost solutions in transmission line construction. But many people seem to feel that undergrounding is the best solution and their views will require even closer attention in forthcoming years.

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## Future Steps

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The development of technology for undergrounding must be done in conjunction with an understanding of the natural impacts of the process. While undergrounding may remove the visual impact, it by no means removes all the environmental impact. For example, a clear cut swath would be required in wooded areas; vegetative cutting and dredging in marshes; bulldozing and clearance through rivers or streams.

Short of undergrounding, Hydro has made significant steps in compaction of overhead towers which will effectively reduce tower heights and right-of-way widths. The results of this research should be expedited and applied to the lines required in this study as soon as possible. In addition, it was recently announced that Hydro was undertaking research on the DAMUT project involving the placement of 230 kV cables in a large, open concrete pipe. This promising method should immediately be expanded for 500 kV transmission.



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# Appendix I

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## CONCERNS EXPRESSED REGARDING IMPACT OF TRANSMISSION CORRIDORS ON PRIME AGRICULTURAL LANDS

1. "Towers to support the 500,000 volt lines at present being considered by the Solandt Commission will be over 100 feet high, necessitating broad base areas. From three to five of these towers will stand abreast in the corridors but will be separated enough to allow service helicopters to land between them. Obviously farmers who rent the corridor back from Hydro will have great difficulty in cultivating, sowing or harvesting areas around and between the towers in each group. Such areas will not only involve non-productive land for which rentals will be paid but will create weed problems causing additional costs. Corridors will be 610 feet wide."
2. "In spite of the plan to service by helicopter, Hydro reserves the right to use the corridor for trucks to transport materials and men for special services to tower lines. It is clear that major damage to crops will occur when such services are carried out."
3. "Farming operations between and around the towers will be slower and time-consuming. In any period of limited good weather and good soil conditions, such wasted time could be costly. Any farmer who has experienced the frustration and loss caused during seeding or harvest by a delay which prevented him from finishing an operation in time to avoid a week or more of bad weather or wet soil will appreciate what such time loss can mean."
4. "A farmer who rents back the corridor cut through his land and who uses high-powered tractor equipment, will need to exercise great care if he attempts to operate such equipment close to the towers. He will be responsible for any damage done to them and any such damage caused by a heavy farm tractor could be of a serious and costly nature. Turning too short and not allowing space enough for the implements, especially if more implements than one are being drawn at the time, have been the cause of such accidents."
5. "The only way to minimize the farm problems caused . . . . would be to place it (the corridor) in the centre of a concession along the rear of farm properties. Here the lines would be as distant as possible from farm dwellings since these are usually located near the roads. . . . There is no question that huge towers in a broad corridor cutting a farm diagonally into two sections would seriously depreciate its value both now and in the future. Hydro's payment for the land would be in terms of land values today. If the trend toward higher land values . . . continues, such payments would be far below the value of the land a few years hence."

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# Appendix I

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6. "The recent Ontario Government land-use plan classifies the farm areas of Esquering as continuing indefinitely in agricultural use. In view of the problems created by the north-south possible Hydro corridor, the west-east corridor for the lines from Nanticoke to Pickering obviously should be routed to avoid this agricultural area."
7. "Farm producers are currently meeting many difficulties through high costs of operation and narrow profit margins caused by fluctuating sale prices. Further complications caused by land loss to Hydro corridors may well be sufficient to prevent some farms from being operated. When consideration is given to the rate at which Ontario's limited farming land is disappearing from agricultural use, the risk of further loss occasioned by Hydro lines being routed through areas specifically designated for future farming is a serious one."
8. "Surveys of citizen opinion to find out what environmental impacts by power line corridors are least acceptable usually reveal large numbers of people concerned over lines going through wooded areas of countryside. Many of these people do not live in the areas under consideration but are organized through membership in conservation groups, naturalist associations and Sierra Clubs. They are reached through their mailing lists and so can voice their opinions in overwhelming numbers. Worthy as their objectives are in connection with such aspects of the environment as woods, streams and sild life, they frequently display a remarkable lack of concern over farm lands and the operations which provide our food. This lack of concern frequently arises from ignorance of farm activities which is understandable since many members of conservation groups are urban dwellers. The emphasis provided by such people through their numbers and their legal representatives tends to outweigh that from farm people who usually are widely scattered, relatively small in number by the very nature of the large farm land areas and often not as efficiently organized to make their wishes known in a concerted fashion. The choice for Hydro corridors frequently is either to go through wooded regions or through farming districts. Surveys of public opinion obviously place the farm voice in an unfavourable position in deciding the choice. Yet farmers are the people whose livelihood is directly and adversely affected by Hydro lines passing through their farms while many active conservationists live in urban areas that are in no way affected by the corridors."
9. "Tower lines in wooded areas can usually be made inconspicuous by trees being left uncut in corridors or by replanting and by placing lines against treed slopes as background. In farm areas the tower lines cannot be concealed because they pass across open fields in full view of residents and others who use both community roads and highways. The "visual

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# Appendix I

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pollution" is at a maximum. Yet conservation groups appear to be much more concerned over certain specific views such as those from recreational areas than open country-side views."

Source: "Reasons For Farmer Objections to Hydro Line Corridors Crossing Farm Lands in Esquesing": Submission enclosed with a letter from Bruce McClure, President, Halton County Federation of Agriculture, February 19, 1973, points reiterated in a letter from Earl Cook, President, Peel County Federation of Agriculture, February 27, 1973, referred to in a letter from H. F. Crown, Director, ARDA Branch, Ministry of Agriculture and Food, March 8, 1973.

Other issues noted by farmers:

1. An important concern of farmers is ceding title to lands taken for rights-of-way, as it represents losing title to part of a farmer's "industrial plant".
2. Farmers are removing fences and fencerows in the Peel Plain area in order to enlarge cultivation areas by heavy equipment.
3. ...."Farmers of this area do not fit the popular misconception that all farmers cannot wait to sell their property in whole or in part in order to make a fortune through land speculation". (letter from G.Kidd, Esquesing Citizens Group, March 19, 1973).
4. ...."There is a very limited supply of Class I and Class II agricultural land in this province and with the many demands that are being placed for non-agricultural use on this land (i.e. residential and industrial development, transportation corridors, energy corridors, recreation areas), this Ministry of the Government is greatly concerned that there be minimal intrusion made on this high quality agricultural land for non-farm purposes....We recognize that this Hydro line must be built. Our recommendation is that it be located through low agricultural productivity lands." (letter from H.F. Crown, March 8, 1973).

# Appendix II

APPENDIX II  
COMPARISON OF ENVIRONMENTAL FEATURES ENCOUNTERED ON ALTERNATE ROUTES

Factor	Area in acres for a 610 foot corridor			
	Route "Q"	Route "S"	Route "T"	Hydro's Route
<b>I PRESENT LAND USE</b>				
URBAN BUILT-UP	24	0	4	16
GENERAL RESIDENTIAL	24	24	24	60
COMMERCIAL	0	0	0	20
INDUSTRIAL	24	24	12	12
EXTRACTIVE INDUSTRIAL	52	76	120	24
GENERAL AGRICULTURE	4404	5096	6048	4420
INTENSIVE AGRICULTURE	12	28	60	28
TREE AND VINE FRUIT CROPS	40	4	4	20
SOLID WASTE	52	52	0	0
<b>II CULTURAL RECREATION AND OPEN SPACE</b>				
CONSERVATION AUTHORITY PARKS	176	4	4	140
GOLF COURSE	112	92	108	60
OTHER OUTDOOR RECREATION	16	0	0	0
TRAIL (CROSSINGS)	1	1	3	6
CEMETERY	2	1	2	0
<b>III TRANSPORTATION LAND USE (Miles parallel)</b>				
PROVINCIAL HIGHWAY	1.3	0	0	0
PROPOSED EXPRESSWAY	23.0	4.5	6.7	11.4
GAS/OIL PIPELINE	13.1	8.4	2.8	0
HYDRO RIGHT OF WAY	19.1	9.0	27.3	24.3
RAILROAD	15.2	9.1	8.9	4.0
AIRPORT ZONE	.5	2.1	.4	1.8
<b>IV PROPOSED LAND USE</b>				
COMMERCIAL	0	20	0	0
RESIDENTIAL, URBAN	540	232	112	68
INSTITUTIONAL	28	0	4	0
INDUSTRIAL	1188	468	448	216
EXTRACTIVE INDUSTRY	0	32	32	0
OPEN SPACE/RESTRICTED	268	284	256	776
NORTH PICKERING COMMUNITY	380	276	276	460
<b>V NATURAL RESOURCES</b>				
WOODLANDS AND PLANTATIONS (UP TO 60')	268	732	1016	1360
MATURE WOODLANDS (OVER 60')	84	196	196	168
COUNTY AND AGREEMENT FOREST	0	36	36	0
AGRICULTURAL CAPABILITY				
CLASS 1	2668	3294	4342	3876
CLASS 2	1164	1236	1112	932
ORGANIC SOILS	24	60	60	340
<b>VI CRITICAL NATURAL FEATURES</b>				
FLOOD PLAIN	180	116	88	136
STEEP SLOPES (NUMBER)	2	0	172	16
LAKES/PONDS (NUMBER)	0	0	52	20
RIVERS/STREAMS (NUMBER)	111	124	97	84
WETLANDS/MARSH	0	68	44	312
SENSITIVE NATURAL SITES	384	564	668	832
<b>VII SCENIC QUALITY</b>				
MAJOR RIVER VALLEY SYSTEMS	1020	292	252	200
WETLAND	0	76	76	272
UPLAND STREAM AND POND	0	40	244	148
SCENIC OUTLOOK	0	0	0	1
DIVERSE LAND FORM	296	848	1508	2184



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## Appendix III

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### PUBLIC MEETINGS HELD DURING THE STUDY

PURPOSE	DATE		LOCATION	APPROXIMATE ATTENDANCE
To introduce Mr. Bruce Howlett and the study he will undertake	DECEMBER	7, 1972	Queens Park	80
To introduce study methodology and request public assistance	JANUARY	4, 1973	Queens Park	80
Progress Report, and preparation for Series I	FEBRUARY	8, 1973	Queens Park	80
SERIES I				
To introduce study methodology and obtain local assistance and input	FEBRUARY	19, 1973	Stouffville	70
	FEBRUARY	20, 1973	Aurora	80
	FEBRUARY	21, 1973	Georgetown	120
	FEBRUARY	22, 1973	Waterdown	35
Special meeting on Tower Design and Substation Design	MARCH	15, 1973	Queens Park	50

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## Appendix III

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PURPOSE	DATE		LOCATION	APPROXIMATE ATTENDANCE
SERIES II				
To present the nine environmental inventory maps and obtain local comments, corrections and additions	MARCH	26, 1973	Goodwood	120
	MARCH	27, 1973	Aurora	250
	MARCH	28, 1973	Freelton	70
	MARCH	29, 1973	Bramalea	150
	MARCH	30, 1973	Queens Park	30
SERIES III				
To present proposed alternative alignments and obtain comments, proposed changes, and recommendations	JUNE	25, 1973	Queens Park (Provincial Agencies)	40
	JUNE	25, 1973	Queens Park (Municipalities)	20
	JUNE	26, 1973	Queens Park (Municipalities)	50
	JUNE	26, 1973	Queens Park (Press Conference)	40

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## Appendix III

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PURPOSE	DATE		LOCATION	APPROXIMATE ATTENDANCE
SERIES III (Continued)				
(To present proposed alternative alignments and obtain comments, proposed changes, and recommendations)	JUNE	28, 1973	Queens Park	100
	JULY	3, 1973	Milton	90
	JULY	4, 1973	Freelton	220
	JULY	5, 1973	Brampton	350
	JULY	6, 1973	Acton	130
	JULY	9, 1973	Aurora	280
	JULY	10, 1973	Maple	75
	JULY	11, 1973	Unionville	70
	JULY	12, 1973	Claremont	100
	JULY	13, 1973	Bolton	180

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# Appendix III

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## MATERIALS AVAILABLE AT REGIONAL MEETINGS

### SERIES I

- Interim Report: The Solandt Commission, October 31, 1972
- Brochure/Questionnaire
- "Introduction, The Environmental Inventory"
- List of Contacts with Municipalities, January/February, 1973
- Summary Notes: February 8 Queens Park Meeting
- Notice of March 15 Queens Park Meeting
- Paper by Bruce Howlett on "Environmental Aspects of Transmission Line Siting", 1972 Submission to the Solandt Commission

### SERIES II

- Paper on "Environmental Inventory Maps"
- Brochure/Questionnaire
- Interim Report: The Solandt Commission, October 31, 1972
- Description of Use of Questionnaires
- List of Data Maps and Books Placed for Local Survey

### SERIES III

- Paper on "Background" to the Study
- "About Transmission Towers and Substations"
- "Selecting Alternate Alignments"
- "Questionnaires Give Guide to Weighting"
- "Further Analysis of Questionnaires"
- Questionnaire
- Route and Systems Map
- "Alternate Systems Addendum - Modified Q"



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## Appendix IV

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### ANALYSIS OF QUESTIONNAIRES

#### General

A total of 736 questionnaires has been analyzed by computer. In late January and in February of this year, approximately 11,000 questionnaires were distributed to identified Agricultural, Environmental and Community groups, to each municipal office in the study region; to the individuals attending meetings at Queens Park and regional meetings, and to all persons on the mailing list. An additional 67 questionnaires were received in late May after computer tabulation had taken place. Therefore these 803 questionnaires represented a return of 7.3% of those distributed.

Responses to each of 18 questions were tabulated, both for the whole group and for each classification, by area, residence and affiliation. Classifications were also combined, so that cross-correlations could be checked, to determine any evident biases. This analysis, however, is only concerned with the responses from single categories and with the overall response.

### Analysis of Respondents

#### By Area:\*

East	47	( 6%)
Central	156	(21%)
West	438	(60%)
South	36	( 5%)
Metro	37	( 5%)
Unknown	22	( 3%)

The majority of respondents (60%) live in the western area. This indicates that people in this area have a much greater degree of concern for the possible effects of the line than those in other areas. It also suggests that the questionnaire responses will reflect the views of people in this area, which may not be truly representative.

#### By Residence:

City	55	( 7%)
Town	57	( 8%)
Rural	557	(76%)
Unknown	67	( 9%)

Respondents are predominantly residents of rural areas, which might presumably be directly affected by the line. There were few responses from urban dwellers in the study area. It is important to note that few questionnaires were distributed in Metropolitan Toronto other than at the Queens Park meetings.

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## Appendix IV

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### By Affiliation:

Agricultural	13	(15%)
Environmental	22	( 3%)
Community Group	114	(15%)
Govt. or Hydro	35	( 5%)
Business	21	( 3%)
Individuals	431	(59%)

The questionnaire did not ask people to state what groups they belonged to, so this information is certainly incomplete. Many of the individuals are likely to be farmers, and others probably belong to groups such as the Concerned Citizens who were active in recruiting people for the meetings. The largest identified groups were agricultural and community interest, while in fact only a few environmentalists responded (or at least identified themselves).

### Tabulation of Results

The complete results have been tabulated on computer print-out sheets which are difficult to handle. For ease of comparison, these results have been analyzed according to a weighting system, as follows:

Each answer omitted or undecided importance	0
Each answer low importance	1
Each answer medium importance	2
Each answer high importance	3

Adding these, and dividing by the number of respondents in the category under examination gives a figure which indicates the average importance that this group gives to each factor. Thus a figure of 3.0 would indicate that the groups were unanimous in assigning a high importance to a feature, and 1.0 would show unanimity in giving it low priority. In practice, such unanimity does not exist, but the actual figure does give a clear indication of relative importance.

These figures have been tabulated for the answers given by each of the categories of respondents to the 18 questions in the questionnaire. The figures, with the number of people in each group, are attached as an appendix, and are the basis of this analysis.

### Analysis of Responses

Two of the questions related to a simple preference rather than an assessment of importance. The answers to these have been expressed as a single percentage representing the majority opinion. These are:

In favour of a single corridor.....	76%
In favour of locating lines parallel to expressways.....	73%

Both these answers give an unequivocal indication of consensus.

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## Appendix IV

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The remaining answers have been weighted in importance as described previously. For the whole group, the relative importance of the various factors turns out to be as follows:

Existing residential land use	2.76
Existing areas of scenic value	2.56
Existing park and recreational areas	2.43
Existing historic sites	2.38
Existing vegetation, trees and woodlots	2.35
Existing wildlife habitats	2.35
Existing rivers, lakes and streams	2.32
Existing agricultural land use	2.31
Existing institutional land use	2.25
Avoidance of conflict with municipal plans	2.23
Areas from which lines can be easily seen	2.18
Toronto-Centred Region Plan proposals	1.85
Avoidance of high land costs	1.83
Existing commercial land use	1.59
Existing industrial land use	1.18
Existing hydro/pipelines and railroads	1.11

Existing residential land use is quite clearly regarded as the most important of all the factors. After that, great importance is attached to scenic value and to parks, with the various other natural features also being regarded as important. The low figures at the other end of the scale can be taken as a positive desire to see the line placed in existing corridors and industrial areas wherever possible. In general, the list does give a fairly clear indication of the importance assigned to the various factors by the average respondent.

### Variations Among Categories

Not all categories of respondents agree with this general assessment. In the table following this analysis, an asterik (\*) has been placed against any group's rating which defers from the average by 0.2 or more. Where the difference is 0.5 or more, two asteriks (\*\*) appear. This gives a readily apparent indication of a deviant opinion by any group.

### Area Differences

The Eastern area shows more deviations from the norm than any other; it rates agriculture low, and gives above average importance to scenic, parks, rivers, and institutional land. These differences may be due to the fact that only 25% of eastern respondents show an agricultural affiliation, compared with 15% of the total respondents. It also attaches more importance to land costs than any other group, and is exceptionally strongly (87%) in favour of a single corridor. The western area agrees almost entirely with the average weightings, except that it attaches more than average importance to agriculture. The central area gives least importance to agriculture and to expressway alignment, while in the south people are less concerned about cost and about residential areas.

City people generally agree with the average weighting, except that they regard agriculture as less important and attach a greater weight to rivers and lakes. People in towns give very high ratings to parks and scenic values,

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## Appendix IV

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and surprisingly give more weight to the Toronto-Centred Region Plan. Rural dwellers agree on all counts with the average, which is to be expected in view of their predominant numbers.

### Differences by Interest

The most significant differences, however, are those among the various interest groups. In particular, respondents who belong to an agricultural interest group show sharply different priorities from the norm. As might be expected, they give much higher emphasis (2.86) to agricultural land use, and they also attach more importance than average to having a single corridor and running parallel to expressways. In a number of other ways, however, the identified agricultural group is consistently at odds with the majority, and gives exceptionally low ratings to parks, historic sites, vegetation, rivers and lakes, wildlife habitat, scenic value, and visibility. This gives a very clear indication that those members of the farming community who identified themselves attached little importance to the natural and aesthetic values to which the rest of the population accords a fairly high priority.

Other interest groups differed from the norm in the opposite direction. Both community interest group members and those whose affiliation was environmental placed greater emphasis on just those features which the farmers rated low. It seems that members of community

interest groups place similar ratings on features of the natural landscape as members of environmental organizations; it is likely that many of them chose to live in this region because of what it offered in this way. Other exceptions to the average were that business respondents placed a low value on agriculture but gave a lot of weight to rivers and lakes; while government representatives regarded residential areas as less important than the average, but were more concerned with institutional land and conformity with official plans.

### Conclusion

In spite of the wide differences among areas and interest groups they did not significantly affect the overall result of the questionnaire. The majority of those who responded were individuals with no identifiable affiliation, and the numbers of these people were sufficient to offset any biases by the other groups. In no case did the total result differ by as much as 0.2 from the rating given by all these individuals. It may therefore be said that no special interest group was able to bring about any significant change in the result of the responses.

These individuals who formed the majority of the respondents, can be described as people of no particular affiliation, who live in a rural area of the western part of the study region. They place strong emphasis on avoiding disturbance to residential areas, prime agricultural land and places of high scenic quality, and in general attach a



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## Appendix IV

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good deal of importance to the natural environment. They want to see a single corridor which follows existing transmission corridors and expressways and are not unduly concerned about its cost.

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\* Counties and Townships Included Within Each Area:

East	:	Ontario County, Darlington Township
Central	:	York Regional Municipality, Simcoe County
West	:	Halton and Peel Counties, Erin and Eramosa Townships, small portion of Dufferin County in study area
South	:	Wentworth County, Puslinch and Guelph Townships, Guelph, small portion of Brant County in study area
Metro	:	Metropolitan Toronto

# Appendix IV

QUESTIONNAIRE NUMBERS

ANALYSIS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	19	No.
TOTAL	2.31	2.76	1.59	1.18	2.25	2.43	2.38	1.11	2.35	2.32	2.35	2.56	2.18	2.23	1.85	1.83	76%	73%	736
City	1.82*	2.64	1.76	1.15	2.24	2.56	2.44	1.05	2.27	2.54*	2.37	2.71	2.26	2.11	1.98	1.71	71%	67%	55
Town	1.90*	2.74	1.37*	1.23	2.23	2.74*	2.53	1.02	2.41	2.49	2.37	2.78*	1.97*	2.14	2.09*	1.97	83%	68%	57
Rural	2.39	2.80	1.53	1.18	2.25	2.46	2.43	1.11	2.43	2.36	2.44	2.59	2.21	2.27	1.82	1.79	77%	77%	557
East	1.98*	2.77	1.74	1.30	2.55*	2.68*	2.43	1.28	2.51	2.55*	2.45	2.76*	2.11	2.17	1.91	2.11*	87%	74%	47
Central	1.81**	2.72	1.74	1.26	2.27	2.40	2.45	1.11	2.34	2.34	2.42	2.56	2.05	1.94*	1.95	1.77	74%	62%	156
West	2.53*	2.62	1.46	1.14	2.22	2.46	2.37	1.10	2.38	2.32	2.39	2.56	2.25	2.31	1.76	1.80	77%	81%	438
South	2.05*	2.47*	1.61	1.11	2.14	2.56	2.50	1.05	2.33	2.33	2.28	2.72	2.04	2.26	1.90	1.48*	83%	75%	36
Metro	1.84*	2.70	1.75	1.16	2.24	2.55	2.46	1.05	2.21	2.56*	2.38	2.73	2.27	2.00*	2.00	1.78	67%	65%	37
Agric.	2.86**	2.66	1.74	1.29	2.27	1.78**	1.83**	1.08	1.85**	1.71**	1.71**	1.81**	1.59**	1.87*	1.62*	1.93	84%	86%	113
Envir't	2.05*	2.69	1.41	1.00	1.96*	2.96**	2.59*	1.00	2.63*	2.67*	2.71*	2.96*	2.23	1.76*	1.82	1.32**	73%	91%	22
Comm'ty	2.30	2.75	1.37*	1.04	2.31	2.75*	2.59*	1.16	2.55*	2.55*	2.64*	2.86*	2.41*	2.27	1.91	1.76	79%	81%	114
Gov't	2.17	2.54*	1.94*	1.12	2.46*	2.43	2.40	1.09	2.09*	2.09*	2.17	2.52	2.23	2.52*	2.20*	1.77	69%	80%	35
Business	1.67**	2.67	1.90*	1.38*	2.19	2.57	2.33	0.95*	2.52	2.76*	2.62*	2.71	2.24	2.24	2.19*	1.62*	71%	67%	21
Indiv.	2.20	2.81	1.54	1.16	2.22	2.54	2.50	1.19	2.47	2.46	2.48	2.68	2.25	2.27	1.84	1.82	76%	70%	431

\*Differs from the average by 0.2 or more

\*\*Differs from the average by 0.5 or more

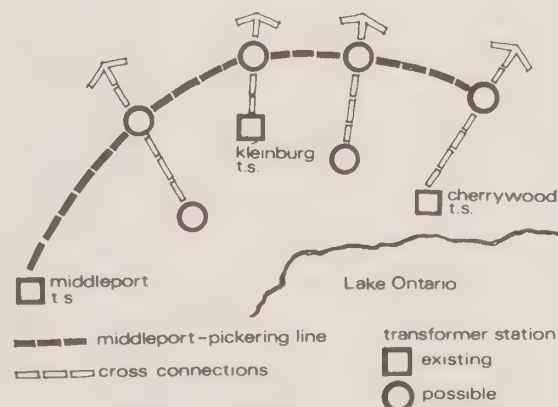
# Appendix IV

## the task

In order to meet southern Ontario's ever growing demands for electric power, Ontario Hydro has proposed the construction of several high voltage transmission lines in the area stretching from Middleport (south of Hamilton) to the Pickering-Oshawa area. Three 500 kV lines are required with additional space for two 230 kV lines alongside. In all, a right-of-way of 610 feet may be needed either in one single corridor or in two separate corridors.

In addition to the Middleport-Pickering corridor, north-south 500 kV cross connections are also required to link the system to generating plants outside the region and to sub-stations near the built-up urban areas along Lake Ontario.

All lines are to be overhead. Information presented during The Solandt Commission hearings last fall indicated that the technology required to place lines underground was not yet adequately developed for use in this major link in the Hydro system.



## the study

Public concern over routes proposed by Hydro for their 500 kV transmission lines resulted in the creation of The Solandt Commission in June, 1972. Following a series of hearings and review of submissions by citizens and municipalities, Dr. Solandt reported on October 31, that further study was needed. He recommended that Mr. Bruce Howlett, an independent planning consultant, carry out additional studies to select environmentally compatible routes within a context of wide citizen participation.

To carry out the Commission's recommendations, a detailed environmental study is being undertaken for the area shown on the next page. Ten regional inventory maps will be prepared, each dealing with a basic environmental topic. Maps will be drawn up in colour, on transparent sheets, so that they can be combined and studied together.

Every factor shown on the inventory maps will be weighted, based in part on the results of attached questionnaire. Several alternative minimum impact routes will then be selected which avoid those features most people consider to be environmentally important. An evaluation will then be made of all alternatives to find the one with the least impact.

## open planning

Through a series of open planning meetings, both at Queen's Park and at four sites in the study area, municipal representatives and the public will be asked to guide and comment on the study as it progresses. Press coverage and the distribution of informational pamphlets and questionnaires will also be used to provide wide understanding of the study.

Meetings at Queen's Park will be held on the first Thursday of every month in the Ontario Room, Ferguson Block, 77 Wellesley St. W., starting at 9:30 a.m. The schedule for meetings in your area can be obtained by calling the Solandt Commission, (416) 965-1431, or your municipal offices.

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# Appendix IV

## questionnaire

### SIGNIFICANT FACTORS IN LOCATING A TRANSMISSION LINE

The following environmental factors are thought to be significant in selecting a minimum impact route for a transmission line. Essentially, in locating a line, one would either try to avoid these factors, or else cross over them with care. We would like YOU to rank these factors in terms of their importance.

Place "H" beside factors that every effort should be made to avoid,  
Place "L" beside factors of little importance,  
Place "M" beside factors of intermediate importance.

FACTORS	IMPORTANCE
<b>Existing Land Use</b>	
1. Agricultural	[ ]
2. Residential	[ ]
3. Commercial (stores, etc.)	[ ]
4. Industrial	[ ]
5. Institutions (churches, schools, etc.)	[ ]
6. Parks and recreation areas	[ ]
7. Historic sites	[ ]
8. Hydro lines, pipelines, railroads	[ ]
<b>Other Factors</b>	
9. Vegetation, trees, woodlots	[ ]
10. Rivers, lakes, streams	[ ]
11. Wildlife Habitat	[ ]
12. Areas of scenic quality (escarpment, hilltops, waterfalls, valleys, etc.)	[ ]
13. Areas from which lines can be easily seen (Visibility)	[ ]
<b>Conflicts With Land Use Proposals</b>	
14. Land Use Proposals in municipal plans and zoning (line should not conflict with plan proposals)	[ ]
15. Land Use Proposals in The Toronto Centred Region Plan (line should not conflict with plan proposals)	[ ]
16. Land Value (avoid high land costs for transmission corridor)	[ ]
17. Other Factors Not Noted Above That You Consider Important	[ ]

### OTHER QUESTIONS

18. Do you think all five transmission lines should be in one corridor ☐, OR in two or more corridors ☐?
19. Generally, should transmission lines parallel expressways despite their being seen by many motorists, ☐, OR should they be located away from highway view ☐?
20. Are there places or areas in your community that should be avoided (environmentally or socially significant features)?
21. Are there groups or organizations in your area that should be invited to our meetings (names, addresses)?

22. Do you wish to be placed on our mailing list?

Name

Address

Organization (if any)

PLEASE RETURN this questionnaire either to the Solandt Commission, 9th Floor, Ferguson Block, Queen's Park, Toronto, or to your municipal offices. If this questionnaire is distributed by a group or organization please return it to them to forward to The Solandt Commission.



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## Appendix V

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### MAILINGS \*

1. NOVEMBER 15, 1972  
Sent By the Solandt Commission
  - notice of retention of Bruce Howlett
  - notice of Dec. 7, 1972 Queens Park meeting
2. NOVEMBER 28, 1972  
Sent by the Solandt Commission
  - letter from Dr. Solandt introducing Bruce Howlett
  - letter from Bruce Howlett inviting public's assistance, giving agenda for Dec. 7, 1972 Queens Park meeting
3. DECEMBER 21, 1972  
Sent by the Solandt Commission
  - notice of Jan. 4, 1973 Queens Park meeting
4. DECEMBER 22, 1972  
Sent by the Solandt Commission
  - To News Media: letter concerning study and its terms of reference; press release concerning Interim Report of Oct. 31, 1972, Jan. 4, 1973 Queens Park meeting, background of Bruce Howlett
5. DECEMBER 27, 1972  
Sent by the Solandt Commission
  - To Groups and Associations: active within study area not already on mailing list, details of study, notice of Jan. 4, 1973 meeting, copy of press release noted above in (4).
6. JANUARY 9, 1973  
Sent by the Solandt Commission
  - summary of Jan. 4, 1973 Queens Park meeting
  - announcement of Feb. 8, 1973 Queens Park meeting
  - announcement of tentative dates, Series I regional meetings
7. JANUARY 25, 1973  
Sent by the Solandt Commission
  - To Municipalities: registered letter asking for assistance, designation of councillor to monitor study, copies of official plans and pertinent local data, noting intention to visit each municipality. Quantity of brochures/questionnaires mailed under separate cover for local distribution.
8. JANUARY 26, 1973  
Sent by the Solandt Commission
  - progress report
  - announcement of Feb. 8, 1973 agenda, Queens Park
  - brochure/questionnaire
  - request for assistance with local environmental survey, and distribution of brochures/questionnaires
9. JANUARY 31, 1973  
Sent by the Solandt Commission
  - schedule for Series I Regional Meetings, Feb.

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## Appendix V

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- 19 to 22, 1973
- To Municipalities: registered letter giving schedule for Series I, and requesting opportunity to meet with elected representatives prior to start of meeting
10. FEBRUARY 23, 1973  
Sent by B.H.I. Limited
- announcing change from March 1 to March 15, 1973 for next Queens Park meeting
11. MARCH 1, 1973  
Sent by B.H.I. Limited
- notice of locations of local information collection data books and maps, responsible volunteers, request for assistance
12. MARCH 2, 1973  
Sent by B.H.I. Limited
- To Groups and Associations: letter requesting assistance with local data, questionnaire distribution; informing members. Included brochure/questionnaires, description of study, list of locations for local inventory maps as noted in (11), schedule of March meetings
13. MARCH 7, 1973  
Sent by B.H.I. Limited
- To Local Public Utilities: letter explaining study, requesting staff member be designated to answer and forward citizen inquiries to them; enclosed list of inventory maps, questionnaires, and locations of local inventory map locations as noted in (11).
14. MARCH 9, 1973  
Sent by B.H.I. Limited
- notice of dates and locations, Series II Regional Meetings, March 26 to 30, 1973
  - reiteration of notice of March 15, 1973 Queens Park meeting
  - request for receipt of further local inventory data
  - description of study process planned up to Series II Regional Meetings
15. MARCH 13, 1973  
Sent by B.H.I. Limited
- To News Media: Press Kit, including all material noted in (14) above, letter to the Editor asking for assistance in publicity, copy of brochure/questionnaire, list of inventory maps and their contents, news releases on study, and on citizen input to date, radio spots for public service announcements
16. APRIL 5, 1973  
Sent by B.H.I. Limited
- To News Media: letter to Editors of all weekly and daily newspapers expressing appreciation

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## Appendix V

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the individuals and groups in their coverage area who assisted with local inventory data collection

17. MAY 1, 1973

Sent by the Solandt Commission

- letter from Dr. Solandt announcing delay in Series III meetings

18. MAY 10, 1973

Sent by B.H.I. Limited

- letter from Bruce Howlett explaining Dr. Solandt's request for delay until publication of information on The Parkway Belt and The Niagara Escarpment
- progress report on study to this date

19. JUNE 12, 1973

(A) Sent by the Solandt Commission

- letter from Dr. Solandt announcing schedule for Series III Regional Meetings, discussion of subsequent hearings of Solandt Commission, request that all pertinent data be brought forth at this time

19. JUNE 12, 1973

(B) Sent by B.H.I. Limited

- letter summarizing study to date, purpose of Series III meetings, availability of large scale maps at local government offices
- notice of Series III Regional Meetings, dates and locations, June 28 to July 13, 1973

- description of questionnaire results
- handbill for public posting giving meeting dates and locations

19. JUNE 12, 1973

(C) Sent by B.H.I. Limited

- To Municipalities: by registered mail, all information listed above
- letter inviting municipal officials to special meetings, June 25 and June 26, Queens Park, re. alternate routes
- notice that a large scale route map would be given to each municipality; request that this map be available to the public
- request that municipalities submit their comments by July 20, 1973 (amended to July 27, 1973)

19. JUNE 12, 1973

(D) Sent by B.H.I. Limited

- To News Media: all information listed above
- letter to the Editor asking for continued assistance
- invitation to press for special Press Conference, June 26, 1973, Queens Park
- news release detailing background to study, purpose of Series III meetings, and need for citizen input

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## Appendix V

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19. JUNE 12, 1973

(E) Sent by the Solandt Commission

- To Provincial Agencies: all information listed above
- letter inviting representation at a special meeting held June 25, 1973, Queens Park

20. JUNE 28, 1973

(A) Sent by B.H.I. Limited

- map and diagrams of alternative routes and systems
- background paper on routes and systems
- paper on recommendations of citizens committees on tower and substation design
- paper on environmental studies
- questionnaire

20. JUNE 29, 1973

(B) Sent by B.H.I. Limited

- To Municipalities: by registered mail, all information listed above
- alternative route maps to 1:50,000 scale

20. JUNE 29, 1973

(C) Sent by B.H.I. Limited

- To Provincial Agencies: all information listed above
- alternative route maps to 1:50,000 scale

20. JUNE 29, 1973

(D) Sent by B.H.I. Limited

- To News Media: all information listed above
- news release on Series III meetings and procedure following these, reiteration of schedule of meetings

\* Unless otherwise noted, all mailings include distribution to municipalities, provincial members of parliament, provincial agencies, news media, groups and associations, and individuals.



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# Appendix VI

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## INITIAL CONTACT WITH MUNICIPALITIES

JANUARY 22, 1973:

- Glanford Township: Mrs. D. Guyatt, Clerk
- East Flamborough Township: Mr. G. Stewart, Clerk
- West Flamborough Township: Mr. J. Smith, Clerk;  
Mr. M. Taylor, Reeve

JANUARY 23, 1973:

- Ancaster Township: Mr. L.B. Hayden, Clerk;  
Mr. Morrow, Planner
- Darlington Township: Mr. W.E. Rundle, Clerk;  
Mr. Riekart, Reeve
- Dundas, Town of: Mr. D. Briault, Clerk
- East Whitby Township: Mrs. Houlding, Assistant to  
the Clerk
- Scott Township: Mr. R.G. Kester, Clerk;  
Mr. N. Lyons, Reeve
- Uxbridge, Town of: Councillor; Mr. Lumgair, Clerk  
was ill
- Uxbridge, Township: Mr. D.S. Kennedy, Clerk
- Waterdown, Village of: Mr. H. Edwards, Clerk
- Wentworth County: Mr. R.E. Eddy Clerk;  
Mr. H.J. Gaasenbeek, Planning Director

JANUARY 24, 1973

- Acton, Town of: Mr. J.T. Hearst, Clerk
- Aurora, Town of: Mr. K.B. Rodger, Clerk
- Burlington, Town of: Mr. W.K. Sims, Clerk;  
Mr. R.M. Moskal, Planner

- East Gwillimbury Township: Mr. J.F. Hopkins, Clerk
- Esquesing Township: Mr. D. French, Clerk
- Georgetown, Town of: Mr. W.R. Smith, Mayor
- Milton, Town of: Mr. E.R. Pearen, Clerk
- Nassagaweya Township: Mr. E.S. Cuddie, Clerk
- Newmarket, Town of: Mrs. Bowser, Deputy Clerk
- Regional Municipality of York: Mr. R.N. Vernon,  
Clerk; Mr. H. Worgan, Planner

JANUARY 25, 1973:

- Erin Township: Mr. L. Lang, Reeve
- Guelph, Town of: Mr. W.G. Hall, Clerk
- Guelph Township: Mrs. E.G. Stephenson, Clerk
- Pickering Township: Mr. D.J. Phitz, Clerk;  
Mr. R.D. Willis, Planning Director
- Pickering, Village of: Mr. H.E. Irwin, Clerk
- Puslinch Township: Mr. G.W. Robson, Clerk
- Wellington County: Mrs. Myers, Clerk
- Whitby, Town of: Dr. M. Michael, Planning Director

JANUARY 26, 1973:

- Albion Township: Mr. C. Patterson, Clerk
- Caledon Township: Mr. V.L. Davison, Clerk;  
Mr. A. Raeburn, Deputy Reeve
- East Caledon, Village of: Mrs. Hughson, Clerk
- King Township: Mr. H.G. Rose, Clerk
- Toronto Gore Township: Mr. M. Byrne, Clerk
- Vaughan, Town of: Mr. J.M. Dewar, Planning  
Director

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## Appendix VI

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### JANUARY 29, 1973:

- Reach Township: Mr. V. Malcolm, Clerk
- Whitchurch-Stouffville, Town of: Mr. R.E. Corner, Clerk

### JANUARY 30, 1973:

- Beverly Township: Mr. J. McColl, Clerk
- Brant County: Mr. R. Foulds, Clerk
- Brantford, City of: Mr. R. Cooper, Clerk
- Brantford Township: Mr. E. Biggar, Clerk
- Onandaga Township: Mrs. B. McMaster, Clerk
- Ontario County: Mr. W.G. Manning, Clerk

### JANUARY 31, 1973

- East Gwillimbury Township: Mr. D.G. Wood, Clerk
- Tecumseh Township: Mr. A.J. Meredith, Clerk
- Richmond Hill, Town of: Mr. W.C. Lazenby, Mayor; Mr. Lynett, Clerk; Mr. H. Rimon, Planning Director

### FEBRUARY 1, 1973:

- Markham, Town of: Mr. N.J. Pickard, Clerk; Mr. B. Powers, Planning Director

### FEBRUARY 2, 1973:

- Central Ontario Joint Planning Board: Mr. F. Manning, Planner
- Dufferin County: Mr. H.W. Baker, Clerk
- Eramosa Township: Mr. L.T. Hindley, Clerk\*
- Mono Township: Mr. H. Lennox, Reeve, and Council

### FEBRUARY 6, 1973

- Amarath Township: Mr. H. Gamble, Clerk\*
- East Garafraxa Township: Mr. H.R. Thompson, Clerk\*

### FEBRUARY 7, 1973

- Chinguacousy Township: Mr. L.R. Richardson, Clerk
- Mississauga, Town of: Mr. W.D. Waite, Planner
- Scarborough, Borough of: Mr. C.A. Tripp, Clerk\*
- Streetsville, Town of: Mr. L.M. McGillivray, Clerk

### FEBRUARY 12, 1973:

- Brampton, Town of: Mr. J. Galway, Clerk\*
- Halton County: Mr. G. Brown, Clerk\*
- Oakville, Town of: Mr. C.D. Hodgson, Deputy Clerk; Mr. E.R. Cumming, Chief Planner\*
- Peel County: Mr. H.H. Rutherford, Clerk\*

\* Called by telephone, with letter following, due to poor road conditions, or inability to obtain appointment.

# Appendix VII

## ECONOMIC COMPARISON OF ROUTES (\$'000) Present Value of Capital to End of 1985 Discounted at 7% Per Annum

### LATTICE AND STEEL POLE TOWERS ACCORDING TO ONTARIO HYDRO GUIDELINES

	"Q"	"S"	"T"	Hydro Route
A—PROPERTY	134,500	82,800	68,000	61,400
B—LINES	121,500	118,600	119,000	101,700
C—STATIONS	106,700	120,000	132,800	134,300
D—COMMUNICATIONS	1,300	300	400	400
SUB TOTAL B + C + D	229,500	238,900	252,200	236,000
A	134,500	82,800	68,000	61,400
GRAND TOTAL \$	364,000	321,700	320,500	297,800
COMPARATIVE ROUTE MILEAGE	144	153	153	144

#### Notes:

- All 500 KV lines are double circuit construction except for a section north of Toronto International Airport in system "Q" where single circuit low profile towers are used.
- Certain facilities which are common to all alternatives are not included in the economic comparison.
- Route mileages include the East—West corridor from a point west of Freelon to Oshawa Area TS, and the North—South corridors.

\*This data is derived from a brief to BHI from Ontario Hydro on the Middleport to Oshawa 500 KV corridors, dated July 31, 1973.

# Appendix VIII

Following is a list of the inventory factors which were mapped on the shaded overlays with the weighted designation shown by:

A - avoid      H - high      M - medium      L-low

## Present Land Use

urban built-up	A
general residential	A
commercial	A
institutional	A
industrial	A
airports	A
communication tower	A
intensive agriculture	H
tree and vine fruit crops	H

## Cultural, Recreation and Open Space

provincial parks and park reserves	H
conservation lands	H
regional parks	H
other recreation areas	H
cemeteries	H

## Proposed Land Use

residential	M
commercial	M
institutional	M
industrial	L
open space and restricted agricultural and rural	M

## Natural Resources

wooded areas (20' to 60')	M
mature forests (over 60')	H
county and agreement forests	H

## Critical Natural Features

erodable soils	L
steep slopes	H
water	H
wetlands and marshes	H
sensitive natural sites	H

## Scenic Quality

major river systems	H
lakes	H
Niagara Escarpment	H
scenic outlooks	H



# Appendix IX

TABULATION OF ROUTE QUESTIONNAIRE RESPONSE

AREA	TOTAL	Directly Affected	PREFERRED SYSTEM					WEST OF 6 THROUGH SWAMP ALONG 401
			MOD. Q	Q	R	S	T	
<b>Ontario County</b>	<b>12</b>	<b>4</b>	<b>3</b>	<b>6</b>			<b>1</b>	
Ajax	1			1				
Oshawa	2		2					
Pickering	3	1	1				1	
Claremont	4	3		3				
Goodwood	2			2				
<b>Metropolitan Toronto</b>	<b>212</b>	<b>21</b>	<b>187</b>	<b>19</b>		<b>1</b>	<b>1</b>	
Toronto	112	13	91	16		1		
Agincourt	5	1	4	1				
Don Mills	8	1	8					
Downsview	15	1	12	2			1	
Etobicoke	18		18					
Islington	15	2	15					
Rexdale	4	2	3					
Scarborough	6	1	6					
Weston	15		15					
Willowdale	12		12					
West Hill	2		2					
Longbranch	1		1					
<b>York Regional Municipality</b>	<b>467</b>	<b>168</b>	<b>13</b>	<b>413</b>	<b>8</b>	<b>2</b>	<b>22</b>	<b>1</b>
Markham	3	1		1	1	1		
Unionville	1						1	
Stouffville	4	3		4				

AREA	TOTAL	Directly Affected	PREFERRED SYSTEM					WEST OF 6 THROUGH SWAMP ALONG 401
			MOD. Q	Q	R	S	T	
Gormley	8	5		4				3
Richmond Hill	15	6	1	4				9
Thornhill	2		1	1				
Aurora	9		2	6				1
Newmarket	42	14	3	36				3
Woodbridge	4	1		2	1			
Maple	3	1						3
Nashville	3	3	2	1				
Kleinburg	9	4		4	3			
King	162	45		158	1			1
Kettleby	119	49		115	2	1		
Pottageville	1	1		1				
Schomberg	79	35	4	73				2
Nobleton	3			3				
<b>Simcoe County</b>	<b>3</b>		<b>1</b>	<b>2</b>				
Tottenham	3		1	2				
<b>Peel County</b>	<b>377</b>	<b>110</b>	<b>225</b>	<b>123</b>	<b>15</b>	<b>3</b>	<b>2</b>	
Mississauga	35	4	28	3	2			1
Clarkson	1		1					
Port Credit	4		4					
Cooksville	1		1					
Meadowvale	3	1	1	1		1		
Belfountain	6		6					
Bolton	45	21	1	41				
Palgrave	1			1				
Orangeville	7		7					

# Appendix IX

AREA	TOTAL	Directly Affected	PREFERRED SYSTEM					WEST OF 6 THROUGH SWAMP ALONG 401
			MOD. Q	Q	R	S	T	
Streetsville	14	4	12	1			1	
Malton	1	1		1				
Brampton	63	17	40	16	6			
Bramalea	10		9	1				
Norval	28	13	25	2				
Snelgrove	2	2		2				
Terra Cotta	47	9	24	19	4			
Cheltenham	21	11	12	6	2			
Caledon	66	21	48	14		1	1	
Alton	5	1	1	3	1			
Inglewood	17	5	5	12				
<b>Halton County</b>	<b>2267</b>	<b>994</b>	<b>1743</b>	<b>177</b>	<b>20</b>	<b>8</b>	<b>8</b>	<b>298</b>
Oakville	36	3	34					
Halton	1	1		1				
Hornby	2		2					
Milton	264	161	157	94	2	2	3	3
Campbellville	147	98	35	35	3	3	4	61
Moffat	17	9	7	5		2	1	1
Eden Mills	18	4	18					
Acton	892	267	884	2	6			
Limehouse	145	54	141	1	3			
Georgetown	453	135	438	10	5			
Glen Williams	20		20					
Burlington	22	15	5	10	1	1		4
Kilbride	250	197	2	19				229
<b>Wellington County</b>	<b>471</b>	<b>162</b>	<b>447</b>	<b>7</b>	<b>1</b>	<b>1</b>		<b>12</b>
Puslinch	19	13	3	2				12

AREA	TOTAL	Directly Affected	PREFERRED SYSTEM					WEST OF 6 THROUGH SWAMP ALONG 401
			MOD. Q	Q	R	S	T	
Guelph	66	11	62	3				
Elora	1				1			
Fergus	1		1					
Grand Valley	2		2					
Arkell	2	2	1	1				
Rockwood	181	95	179	1		1		
Ballinafad	2	1	2					
Erin	111	9	111					
Hillsburgh	74	31	74					
Orton	12		12					
<b>Wentworth County</b>	<b>131</b>	<b>86</b>	<b>10</b>	<b>8</b>	<b>3</b>	<b>7</b>	<b>5</b>	<b>92</b>
Hamilton	33	20	6	1		2	4	18
Dundas	2	2		1				
Waterdown	7	1	3	3	1			
Mill Grove	3	1		1				1
Carlisle	10	6	1	2				7
East Flamborough	5	3						5
Mountsberg	1	1						1
Freelton	70	52			2	5	1	60
<b>Unknown</b>	<b>65</b>	<b>29</b>	<b>7</b>	<b>49</b>				<b>9</b>
<b>Outside Study Area</b>	<b>39</b>	<b>2</b>	<b>36</b>	<b>1</b>	<b>2</b>			
<b>GRAND TOTAL</b>	<b>4044</b>	<b>1526</b>	<b>2672</b>	<b>805</b>	<b>49</b>	<b>22</b>	<b>39</b>	<b>412</b>

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# List of Photographs

page 7		page 55	-the Parkway Belt near Highway 48 (location of preferred route).
upper left	-typical agricultural plain in Halton and Peel Counties.		
lower left	-Oak Ridges Moraine and Halls Lake near Mount Wolfe.	page 57	-Highway 7 (the Parkway Belt) looking west towards Bathurst Street.
right	-Highway 7 and Yonge Street- the Parkway Belt.	opposite page 58	-the Parkway Belt in the vicinity east of Highway 400 (location of preferred route).
page 8	-a typical farm in the agricultural area of Chinguacousy Township.		
page 9	-Kelso Conservation Area at Highway 401 and the Niagara Escarpment.	page 62	-an example of a hydro right-of-way in Metropolitan Toronto being used for recreation.
page 10	-abandoned lime kilns on the Niagara Escarpment near Campbellville.	page B7	-Niagara Escarpment in the Caledon Hills area near Inglewood.
page 19	-typical suburban development along Yonge Street North.	page B59	-typical farmstead in the agricultural plain of Peel County.
page 20	-agricultural operations existing in compatibility with a single transmission line.	page B62	-graphic representation of a double circuit lattice tower on a photographic background of agricultural land with a woodlot.
page 22	-gravel pits along Highway 401, west of the Niagara Escarpment.	page B63	-similar to above but with double tubular pole "improved appearance".
page 50	-looking west in the Parkway Belt adjacent to Keele Street (location of preferred route).	page B64	-similar to above but with a double circuit H-Frame, tubular pole adjacent to Highway 401 at the Niagara Escarpment.



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# List of Photographs

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- |          |  |
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| page B68 | -example of a joint-use corridor with a highway and power line in the Don Valley, Toronto. |
| page B69 | -Ontario Hydro's single circuit 500 kV line north of Kleinburg.                            |

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## Notes

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# Errata

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## Photographic Credits:

Frontispiece: 'The Public', page 11, The Brampton Daily Times and Conservator

Pages B62,B63, B64, photos and graphics, George Baird Architects, Toronto

page 20, line 3, left, "area" should be "areas"  
page 21, line 15 and 16, left, "industrail" should be "industrial"  
page 22, line 23, left, "Ontario," should be "Ontario;"  
page 28, line 10, left, "on" should be "of"  
page 34, line 24, right, "line" should be "link"  
page 41, line 4, right, "was" should be "were"  
page 41, line 9, right, "watercourse" should be "watercourses"  
page 58, line 18, left, "or" should be "of"  
page 58, line 24, left, "ans" should be "and"  
page 60, line 19, right, after "structures" add "which will"; and change "requires" to "require"  
page B21, line 11, right, "affect" should be "effect"  
page B24, line 7, left, "bureaus" should be "bureaux"  
page B28, line 26, left, after '500 kV' add "lines"  
page B31, line 2, right, "or" should be "on"  
page B34, line 8, right, "protion" should be "portion"  
page B37, line 17, left, "Woodbriedge" should be "Woodbridge"  
page B39, line 1/, left, "The" should be "the"  
page B41, line 21, left, "prople" should be "people"  
page B42, line 10, left, "subsdatation" should be "substation"

page B44, line 20, left, "out buildings" should be "out - buildings"  
page B44, line 14, right, insert quotation marks to read: 'bridge to Parkway " "  
page B50, line 11, right, insert quotation marks to read: 'could only be viewed as tragedies" '  
page B51, line 20, left, "disection" should be "dissection"  
page B51, line 9, right, "sever" should be "severe"  
page B52, line 5, right, "diviation" should be "deviation"  
page B56, line 5, left, replace "of" with "from"  
page B59, line 8, right, "solveable" should be "solvable"  
page B67, line 7, right, "labeled" should be "labeled"  
Appendix Iii, line 2, right, "sild life" should be "wild life"  
Appendix VIIi, Economic Comparison Of Routes, under Sub Total B+ C+D total for Hydro Route , "236,000" should be " 236,400" , under Grand Total \$, total for "T", "320,500" should be "320,200"



















